NETWORK WORLD
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California acts to spur LAN usage

By Timothy O'Brien
West Coast Bureau Chief

SACRAMENTO, Calif. — In a move designed to boost worker productivity and cut computing costs, the state of California last week revamped its acquisition policies to make it easier and less expensive for state agencies to purchase local-area networks.

As of this week, state agencies will be able to purchase LAN hardware and software with little delay through an open-ended contract with Businessland, Inc., which operates what is known as a state store here where government offices can already buy personal computers, peripherals and software.

The contract arrangement eliminates much of the bureaucratic wrangling involved in equipment acquisitions and offers state agencies significant volume discounts. Businessland has held the state store contract since 1986.

The move is expected to result in a surge of network installations. A department can now give the store a purchase order for LAN hardware and software valued at as much as $100,000 and expect delivery in 10 days. Previously, net purchases handled

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PHOTO ©1991 WALTER CALAHAN

The General Services Administration's Mike Corrigan

GSA executive discusses FTS 2000 issues, concerns

Q&A It's doubtful that any single network upgrade effort ever received as much attention as the U.S. government's move from a snarl of Centrex services to the two digital networks specified under the enormous Federal Telecommunications System (FTS) 2000 network contract.

In many ways, the FTS 2000 package is a sign of coming trends in corporate networking. Plans call for use of such innovations as switched digital services, automatic number identification (ANI) and Integrated Services Digital Networks.

But the fundamental reason FTS 2000 was created was to save money. Aggregating traffic is supposed to save taxpayers hundreds of millions of dollars every year. However, there have been reports of billing and equipment problems associated with the conversion from the government's old networking arrangement to FTS 2000.

To explore the promise and reality of FTS 2000, *Network World* Features Editor Paul Strauss spoke with Michael Corrigan, assistant commissioner for telecommunications services at the U.S. General Services Administration and the man in charge of FTS 2000.

FTS 2000 is now 2 years old. Could you give us a

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American Airlines plots OSI migration

Firm migrates SABRE, SNA net to X.25 backbone, works to develop OSI profile for airline industry.

By Paul Desmond
Senior Editor

FORT WORTH, Texas — Officials of American Airlines, Inc. last week laid out their strategy for migrating the SABRE reservation system to an OSI-based network that will ease communications among processors within SABRE and at other airlines.

As part of that effort, American Airlines is working with other major U.S. air carriers to draft an Open Systems Interconnection profile that addresses the open networking needs of the transportation industry.

Bruce Parker, vice-president of application development with American Airline's SABRE Computer Services unit, likened the Aeronautical OSI Protocol (AOSIP) to the federal government's Government OSI Profile.

American Airlines is already migrating SABRE and an IBM Systems Network Architecture net to an X.25-based backbone that will serve as a network utility, enabling any attached device to communicate with any other, said Max Hopper, the airline's senior vice-president of information systems.

American Airlines executives outlined their OSI strategy during a daylong Information Technology Forum hosted by the airline at its headquarters here.

The strategy behind the AOSIP effort is to provide an industry-standard means of communica-

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INSIDE

Studying the latest ISDN options for strategic net architectures, page 40.

AT&T at war over rivals' custom nets

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — During the past two years of wrangling over the legality of Tariff 12, another regulatory battle has been quietly brewing that threatens to undermine the custom networks provided by AT&T's rivals.

One year ago this week, AT&T filed a complaint with the Federal Communications Commission attacking US Sprint Communications Co.'s off-tariff network arrangements with major users such as PepsiCo, Inc. Earlier, AT&T filed a similar complaint against MCI Communications Corp. concerning deals with users such as Merrill Lynch & Company, Inc., Westin Hotel Co. and United Air Lines, Inc.

AT&T's protests strike directly at the heart of certain FCC rules that, in essence, deregulated oth-

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NETLINE

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BUSH ADMINISTRATION vows to veto spectrum reallocation bills that don't call for auctioning. Page 5.

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CEBIT ATTENDEES clamor for more market-ready OSI products. Page 6.

FCC PROPOSES a set of new regulations to stem abuses in the 900 services industry. Page 68.

HP INTRODUCES AN API for building applications that link central office switches and HP minis. Page 69.

NEWSPAPER

FEATURE

Tariff info providers track rates for users

By Daniel Briere
Contributing Editor

Many consumer products are sold with their prices clearly stated on a label. But it's not so easy to obtain comparative end-to-end pricing on telephone services, at least not from the carriers.

Consider some of the factors involved in selecting one long-distance circuit. These include information about the access and long-haul rates, options, service areas and availabilities, and onetime and recurring charges involved.

To be useful, all of these factors should be cross-referenced by the company's branch office location, the carrier's points of presence and the local access and transport areas served.

Tariff information services keep track of all these various elements and keep the information current. They cover local, long-distance and international service availability and rate information through a variety of media, mostly paper-based loose-leaf guides or individual tariff files. Also, some limited

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User Alliance develops plan to promote open systems

Nearly 50 users convene to hammer out group's mission statement and form product requirements.

By Ellen Messmer
Washington Correspondent

DALLAS — In its first working meeting since the group was formally organized last September, the User Alliance for Open Systems met here last week to further define what the fledgling group hopes to achieve.

The User Alliance — formerly the Houston 30 — is perhaps best known for its report "Overcoming Barriers to Open Systems Information Technology," which blamed both users and vendors for the cultural and business obstacles to implementing open systems.

The approximately 50 users attending the meeting last week broke out into four main working groups to formulate positions about OSI product requirements, education, OSI cost-justification strategies, and de jure and de facto standards. Two other groups met to put together the alliance's vision statement and organizational bylaws.

Although most of the working groups bore fruit, at least one seemed to die on the vine, the victim of a young organization still searching for what to tackle first.

One group led by Catherine

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Open systems play role in U.S. victory against Saddam

Sprawling Desert Storm net helps forces win war.

By Eric Smalley
Senior Editor

A minicomputer in an army truck in the middle of the desert would seem to be the most isolated system on earth, the epitome of a stand-alone computer.

But when most U.S. Army troops arrived in Saudi Arabia over the course of Operation Desert Shield, they found a network already in place that allowed them to tie their computers to those of other units in the desert, to Army computers stateside and to the entire Internet community.

Only days after Iraq invaded Kuwait, the U.S. Army Information Systems Command began extending the global Defense Data Network (DDN) to Saudi Arabia in support of the handful of soldiers initially deployed there.

By January, the network consisted of 20 subnets, three command centers linked by land lines, and two mobile satellite ground stations. The volume of traffic between Saudi Arabia and the U.S. reached 50M bytes per day, according to Chief Warrant Officer Robert Weissert, the Army's Internet manager.

The network was tied into the Saudi Arabian post, telegraph and telephone administration and the Army's tactical telecom-

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Tool aids in building OLTP client/server applications

By Timothy O'Brien
West Coast Bureau Chief

SAN JOSE, Calif. — Cooperative Solutions, Inc. last week announced an application development system designed to assist programmers in building on-line transaction processing (OLTP) applications for client/server architectures.

Ellipse is designed to help users deal with the challenge of downsizing critical applications from mainframe or minicomputer environments to local-area networks. It enables developers with little or no expertise in OLTP or client/server applications to develop, test and deploy applications that run concurrently on LAN servers and workstations.

Ellipse includes two components: The Ellipse Development Environment (Ellipse/DE) and the Ellipse Production System (Ellipse/PS).

Ellipse/DE is a multiuser development system that allows LAN-based developers to cooperatively design, test and deploy what the company calls client/server transaction processing applications.

Developers share a library of common application routines and objects stored in a repository.

Ellipse/DE also includes tools for configuration management, version control, debugging and prototyping.

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Briefs

Novell to unveil system upgrade. Novell, Inc. this week is expected to bring out the next release of its NetWare network operating system for Intel Corp. 80286-based machines, according to sources. The new version is expected to be more than just an upgrade to the existing NetWare 286.

Analysts predict it will combine many of the features of Novell's current 286-based offerings, including Levels I and II of Novell's ELS NetWare, Advanced NetWare and SFT NetWare. Analysts also expect a similar pricing and packaging scheme as introduced with NetWare 3.11, predicting 10-, 50- and 100-user versions of the new offering.

High-speed digital links to Germany. AT&T and the Deutsche Bundespost Telekom last week announced an agreement to offer switched 64K bit/sec service between the U.S. and Germany. Under the agreement, AT&T will link its Switched Digital International network with the German post, telegraph and telephone administration's Integrated Services Digital Network. The service is expected to be used for applications such as videoconferencing and electronic data interchange, an AT&T spokesman said. AT&T already offers switched 64K bit/sec service to 10 other countries, including Australia, Belgium and France.

ATMs get stamp of approval. Buying stamps will soon become more convenient when the U.S. Postal Service joins with financial institutions nationwide to sell stamps from automated teller machines. Citing highly favorable results from consumer focus groups and a successful trial program with a Seattle-based bank, the postmaster general recently unveiled the design of a new 29-cent ATM stamp. The stamp will be available nationally by the end of the summer.

GTE/Contel merger gets final nod. The California Public Utilities Commission last week approved GTE Corp.'s merger with Contel Corp. But the commission is requiring GTE to keep separate Contel's regulated phone business in California until the two companies submit a comprehensive plan for consolidating their financial reports as a single phone company. The merger will make GTE the largest U.S.-based local telephone company.

ONC twice if you back Sun. Five networking software vendors will announce this week at the Sun Microsystems, Inc.'s Connectathon Conference in San Jose, Calif., their intention to pool engineering resources to develop applications for Sun's Open Network Computing/Network File System (ONC/NFS) environment.

The networking companies are Beame & Whiteside Software, Ltd., FTP Software, Inc., InterCon Systems Corp., Interlink Computer Sciences, Inc. and TGV, Inc.

The applications will run across the operating systems supported by the participating vendors, including DOS, OS/2, Microsoft Corp.'s Windows 3.0, Apple Computer, Inc.'s Macintosh, Unix, VMS and IBM's mainframe operating systems. The vendors offer Transmission Control Protocol/Internet Protocol products, but the future applications based on the ONC/NFS remote procedure call technology will eventually be transport-independent.

DEC intros ODA gateway. Digital Equipment Corp. last week at the Hannover Fair CeBIT exposition in Hannover, Germany, introduced a gateway for VMS-based VAXes that converts files between its Compound Document Architecture (CDA) and the Open Systems Interconnection Office Document Architecture (ODA) for transmission across X.400 electronic messaging networks.

The gateway will enable users in CDA environments to share files via X.400 nets with users that support ODA. The gateway, which was demonstrated at CeBIT last year, will be available beginning in April.

MCI lands lucrative Vnet deal. MCI Communications Corp. last week announced the receipt of a multiyear, multimillion-dollar contract to provide voice communications services to AMR Corp., the parent company of American Airlines, Inc.

Under the contract, MCI will build AMR a virtual network service linking more than 400 airport facilities, sales and ticket offices to its world headquarters at Dallas/Fort Worth International Airport. AMR will also use MCI's 800 service. The MCI Vnet complements voice services that AT&T provides to AMR under a Tariff 12 arrangement.

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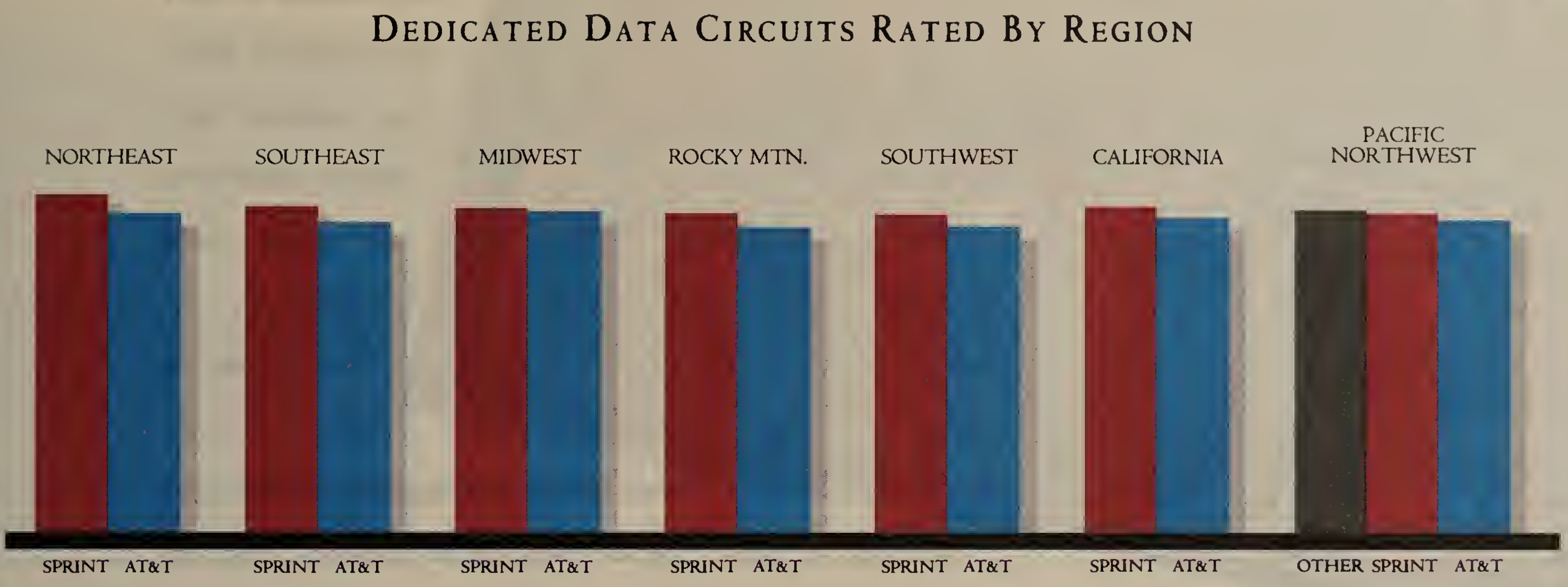

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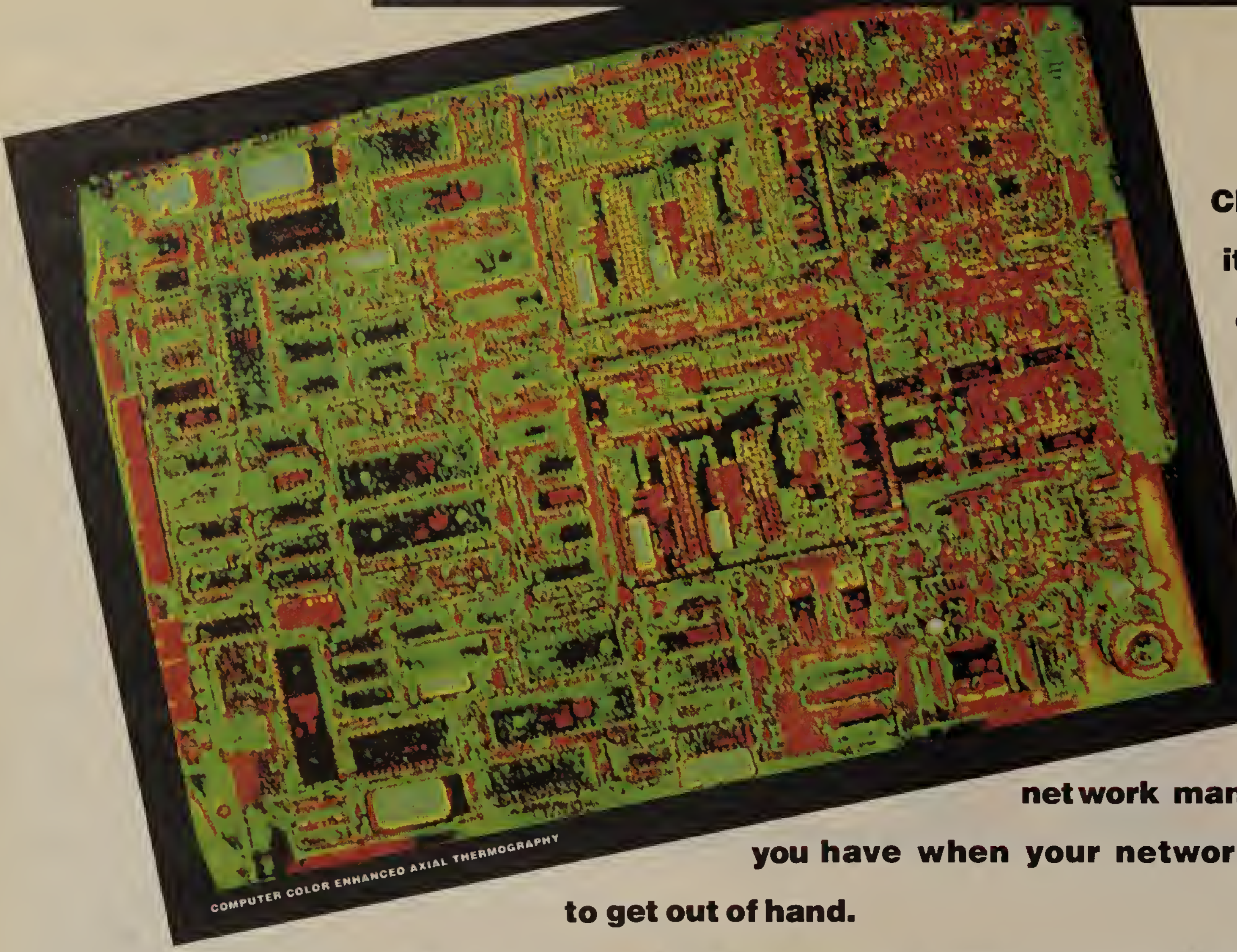

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C. Please Answer ALL Questions, Sign & Date the Form.

1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
13. ☐ Government State/Local
14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other ____________

2 Job function: (check one only)

1. ☐ Networking Management (Responsible for both voice & data)
2. ☐ MIS Management (VP, Dir., Department Head)
3. ☐ Corporate Management (Chairman, President, Owner, General Manager, CEO, CIO, VP)
4. ☐ Data Communications Management (Responsible for data only)
5. ☐ Telecommunications Management (Responsible for voice only)
6. ☐ Financial Management
7. ☐ Engineering Management
8. ☐ Consultant (Independent)
9. ☐ Other ____________

3 What is the scope of your involvement in purchase decisions for Network/Communications products + services? (check one only)

1. ☐ Enterprise Wide (Organization/Subsidiary/Division)
2. ☐ Multi Enterprise (Consultants)
3. ☐ Department Wide

4 What is the total number of sites for which you have purchase influence?

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

5 Your primary responsibility: (check one only)

1. ☐ Both Data + Voice
2. ☐ Data Networking Only
3. ☐ Voice Networking Only
4. ☐ None

6 Which transmission media do you use in your network: (check all that apply)

Public:
01. ☐ Switched-Based (DDD, Wats, Megacom, etc.)
02. ☐ Leased Line (not including T-1)
03. ☐ T-1
04. ☐ Fractional T-1
05. ☐ T-3/SONET
06. ☐ Broadband
07. ☐ ISDN

Private:
08. ☐ Satellite
09. ☐ Microwave
10. ☐ Fiber Optic

7 Is your network: (check all that apply)

LOCAL AREA NETWORK
1. ☐ Local (within building)
2. ☐ Local (in a campus environment)

WIDE AREA NETWORKS
3. ☐ International
4. ☐ National
5. ☐ Regional (several states)
6. ☐ Metropolitan

8 What is your network architecture? (check all that apply)

1. ☐ SNA
2. ☐ DECNET
3. ☐ OSI
4. ☐ GOSIP
5. ☐ MAP/TOP
6. ☐ TCP/IP
7. ☐ DCA (UNISYS)
8. ☐ OTHER ____________

9 What is your LAN Operating System? (check all that apply)

01. ☐ 3COM (3+, 3+open)
02. ☐ LOCAL TALK (APPLETALK)
03. ☐ BANYAN (VINES)
04. ☐ DCA (IRMALAN)
05. ☐ IBM (LAN Server)
06. ☐ IBM (PC LAN PROGRAM)
07 ☐ MICROSOFT (LAN MANAGER)
08. ☐ UNGERMAN BASS (NET/1)
09 ☐ NOVELL (NETWARE)
10. ☐ TOPS
11. ☐ PROTEON (PRONET)
12. ☐ OTHER ____________

10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCALTALK
8. ☐ 10BASET
9. ☐ OTHER ________

11 Which operating systems do you utilize? (check all that apply)

1. ☐ IBM DOS (VSE)
2. ☐ UNIX
3. ☐ OS/2
4. ☐ OS/2 Extended Edition
5. ☐ MVS
6. ☐ VM
7. ☐ VMS
8. ☐ XENIX
9. ☐ PICK
0. ☐ OTHER ______

12 Please indicate by vendor the number of mainframes/minicomputers installed in your network.

VENDOR	MAINFRAMES A	MINIS B
01. DEC		
02. IBM		
03. AMDAHL		
04. AT&T		
05. BULL HN IS		
06. NCR		
07. DATA GENERAL		
08. WANG		
09. HEWLETT PACKARD		
10. PRIME		
11. TANDEM		
12. UNISYS		
13. CONTROL DATA		
14. OTHER		

13 Please indicate by vendor the number of microcomputers/workstations:

A. Presently installed in your network.

B. The approximate quantity you plan to install in the next 12 months.

MICROCOMPUTER/ WORKSTATION/ VENDOR	PRESENTLY INSTALLED A	PLAN TO INSTALL NEXT 12 MONTHS B
01. PCs based on 80286 chip		
02. PCs based on 80386 chip		
03. PCs based on 80486 chip		
04. 8086/8088		
05. Macintosh		
06. RISC-based workstations		
07. UNIX-based workstations		

14 What is your planned PC standard? (check all that apply)

1. ☐ EISA
2. ☐ MCA
3. ☐ NUBUS (MACINTOSH)

15 For which areas outside of the U.S. do you have purchasing influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

16 Check ALL that apply in columns A and B

A) I am presently involved in the purchase process for the following products/services:

B) I plan to purchase the following products/services in the next 12 months:

Presently Involved A	Plan to Purchase B	
A	B	LOCAL AREA NETWORKS:
01. ☐	☐	Local Area Networks
02. ☐	☐	LAN Servers
03. ☐	☐	LAN Services
04. ☐	☐	Cables, Connectors, Baluns
05. ☐	☐	Bridges, Routers, Gateways
06. ☐	☐	UPS
07. ☐	☐	LAN Storage Devices
A	B	COMPUTERS/PERIPHERALS:
08. ☐	☐	Micros
09. ☐	☐	Minis
10. ☐	☐	Mainframes
11. ☐	☐	Front End Processors
12. ☐	☐	Terminals
13. ☐	☐	Laptops
14 ☐	☐	Printers
15 ☐	☐	Work Stations
16. ☐	☐	Cluster Controllers

(continued on next column)

Presently Involved A	Plan to Purchase B	SOFTWARE:
17. ☐	☐	Network Management
18. ☐	☐	Micro to Mainframe
19. ☐	☐	Network Security
20. ☐	☐	Call Accounting
21. ☐	☐	Distributed DBMS
22. ☐	☐	Communications Software
23. ☐	☐	Applications Software
24. ☐	☐	Network Operating Systems Software
25. ☐	☐	EDI Software
26. ☐	☐	E-Mail Software
A	B	DATA COMMUNICATIONS:
27. ☐	☐	Modems (over 9.6kbps)
28. ☐	☐	Modems (under 9.6kbps)
29. ☐	☐	T-1 Multiplexers
30. ☐	☐	T-3 Multiplexers
31. ☐	☐	Fractional T-1 Multiplexers
32. ☐	☐	Data Switches
33. ☐	☐	Matrix Switches
34. ☐	☐	Packet Switches
35. ☐	☐	Protocol Converters
36. ☐	☐	Network Management Systems
37. ☐	☐	Terminal Emulation Boards
38. ☐	☐	Facsimile Machines
39. ☐	☐	Diagnostic Test Equipment
40. ☐	☐	DSU/CSU
41. ☐	☐	Data Security
42. ☐	☐	Data Compression Equipment
43. ☐	☐	Network Adapter Boards
44. ☐	☐	Microwave
45. ☐	☐	Messaging Software
A	B	TELECOMMUNICATIONS:
46. ☐	☐	PBXs (over 1000 lines)
47. ☐	☐	PBXs (200 - 1000 lines)
48. ☐	☐	PBXs (under 200 lines)
49. ☐	☐	Key Systems
50. ☐	☐	Automatic Call Distributors
51. ☐	☐	Voice Messaging Systems
52. ☐	☐	Video Teleconferencing Systems
A	B	SERVICES:
53. ☐	☐	Switched Voice
54. ☐	☐	Dedicated Leased Line
55. ☐	☐	T-1
56. ☐	☐	T-3
57. ☐	☐	Digital Data
58. ☐	☐	Packet Switched
59 ☐	☐	Centrex
60. ☐	☐	Central Office Lan
61. ☐	☐	Satellite
62. ☐	☐	On-Line Information
63. ☐	☐	ISDN
64. ☐	☐	EMail
65. ☐	☐	VSAT

17 Estimated value of networking equipment and services:

A: Which you helped specify, recommend or approve in the last 12 months?

B: Which you plan to help specify, recommend or approve in the next 12 months?

A	B	
1 ☐	☐	$100 million and over
2 ☐	☐	$50 - $99.9 mill
3 ☐	☐	$25 - $49.9 mill
4 ☐	☐	$20 - $24.9 mill.
5 ☐	☐	$10 - $19.9 mill.
6 ☐	☐	$5 - $9.9 mill.
7 ☐	☐	$1 - $4.9 mill.
8 ☐	☐	$500,000 - $999,999
9 ☐	☐	Under $500,000

18 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ over $10 billion
2. ☐ $1 to $9.9 bill.
3. ☐ $500 to $1 bill.
4. ☐ $100 to $499.9 mill.
5. ☐ $50 to $99.9 mill.
6. ☐ $10 to $49.9 mill.
7. ☐ $5 to 9.9 mill.
8. ☐ under $5 mill.

19 Estimated number of employees for your entire corporation:

1. ☐ over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ under 500

20 Which of the following ISDN products do you plan to purchase in the next 12 months? (check all that apply)

1. ☐ Basic Rate Interface Terminal Adapters
2. ☐ Primary Rate interface Equipment
3. ☐ Voice/Data terminals
4. ☐ Voice-only terminals
5. ☐ Data-only terminals

21 From which of the following vendors will you consider buying your PBX/Central Office Switch? (check all that apply)

A PBX	B COS	
A ☐	☐	AT&T
B ☐	☐	ALCATEL
C ☐	☐	ERICSSON
D ☐	☐	FUJITSU
E ☐		HARRIS
F ☐		HITACHI
G ☐		ROLM
H ☐		INTECOM
I ☐		MEMOREX TELEX
J ☐		MITEL
K ☐	☐	NEC
L ☐	☐	NORTHERN TELECOM
M ☐		SAMSUNG
N ☐	☐	SIEMENS
O ☐		STROMBERG-CARLSON
P ☐		TOSHIBA
Q ☐	☐	OTHER ____________

NETWORK WORLD
The Newsweekly of Enterprise Networking Strategies
An IDG Publication

Q1NN

Aspect net mgmt. system offers remote ACD control

Workstation-based center monitors up to 16 ACDs, supports X Window, Motif graphical user interfaces.

By Bob Wallace
Senior Editor

SAN JOSE, Calif. — Aspect Telecommunications Corp. is expected to unveil this week a workstation-based net management system that will enable users to centrally manage remote automatic call distributors (ACD).

The net management system, dubbed Aspect Systems Management Center, is based on a Motorola, Inc. 68030 microprocessor-based workstation that runs Unix System V and supports the X Window System and the Open Software Foundation's Motif graphical user interface.

The product will enable users to monitor alarms from as many as 16 remote ACDs attached via 9.6K bit/sec analog modem links. Without it, users need to manage each ACD from individual terminals. Users can attach the System Management Center to a local CallCenter ACD via an RS-232 port, employ a limited-distance modem to reach a CallCenter as far as 1.8 miles away, or use dial-up or leased lines to reach remote ACDs.

The product will enable users to monitor alarms from as many as 16 remote ACDs.

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The System Management Center enables users to monitor call center traffic, overall system performance, alarm conditions and resource utilization. The product also enables customers to activate trunks, change agent group sizes, modify the ACD's call routing tables or check short-term call center service levels.

In future releases, Aspect plans to enhance the system to offer management reports that give users a systemwide overview of their CallCenter ACD network and the ability to troubleshoot network problems.

The system's user interface will enable network managers to

(continued on page 67)

Bush to veto bills that don't back spectrum auctioning

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — Following a hearing here last week in which Democrats denounced the concept of spectrum auctioning, a Bush administration official said the president intends to veto any legislation that does not support the sale of radio bandwidth.

The bitter disagreement between Democrats and Republicans threatens to derail proposed legislation in both the House and Senate that would reallocate 200 MHz of government spectrum to the private sector, potentially opening up bandwidth for emerging wireless technolgies.

At a House Subcommittee on Telecommunications and Finance hearing on the recently proposed H.R. 531, The Emerging Telecommunications Technologies Act of 1991, Rep. Edward Markey (D-Mass.) and other Democrats sharply criticized the concept of spectrum auctioning, making it unlikely that Congress will buckle under to White House demands to amend the proposed bill to include the administration's auctioning proposal.

Janice Obuchowski, head of the National Telecommunications and Information Administration (NTIA), was angrily rebuffed by Markey when she spoke in favor of spectrum auctioning.

Both Obuchowski and Markey agreed during the rancorous exchange that the current lottery system had produced blatant profiteering, where lottery winners sold off their cellular licenses to corporations that had actually invested in the systems in order to use the frequencies.

But Markey, reminding Obuchowski that the lottery system had been initiated by the Reagan administation to replace a comparative hearing process, rejected spectrum auctioning as a solution to the inadequacies of the current allocation process.

"You equate the public interest with money," Markey told Obuchowski. "You're holding [H.R. 531] hostage."

H.R. 531, introduced by Markey and Rep. John Dingell (D-Mich.), has received industry-wide support because it would help relieve spectrum crowding for commercial users by making 200-MHz frequencies available from the government's spectrum allocations.

But last week, Obuchowski argued that the government deserves to benefit from sacrificing the spectrum by seeing a monetary return through auctioning. "At a time when the budget deficit is critical, we shouldn't be giving away this scarce spectrum reserve," she said.

Obuchowski spoke in favor of another bill, introduced last week by Reps. Don Ritter (R-Pa.) and Michael Oxley (R-Ohio), which supports basically verbatim NTIA recommendations to Congress that back spectrum auctioning.

The Spectrum Reallocation and Improvement Act of 1991 targets 200 MHz of government spectrum below 6 GHz for reallocation but does not hold the government to the 200-MHz figure precisely.

The new Ritter-Oxley bill also calls for the sale of the bandwidth through a competitive bidding process.

The bill would allow the Federal Communications Commission or subsequent legislation to determine which public safety or user groups should be exempted from the auctioning process. It also carries a grandfather clause that protects current licensees.

Obuchowski fielded criticism from congressmen that auctioning would bring about a system that would disadvantage entrepreneurial interest in developing new services and technologies for spectrum use.

She said the administration's plan urged the FCC to establish a flexible payment schedule for those who win spectrum auctions.

Support for auctioning varied among the companies testifying at the House hearing.

Isaac Nassi, director of research and technology, Eastern region, at Apple Computer, Inc., told Congress, "Apple believes that marketplace mechanisms, including competitive bidding, in certain circumstances, should be authorized as one of the FCC's and NTIA's spectrum management tools."

However, Nassi said that if Apple's request for the establishment of 40 MHz of spectrum exclusively for wireless local-area networks is granted, the 40 MHz should not be licensed to anyone, but rather remain free for all.

Others, such as Wayne Schelle, chairman of American Personal Communications, Inc., which holds several FCC experimental licenses to conduct personal communications network tests in the Baltimore area, rejected spectrum auctioning outright. The practice should be rejected, he said, because it dampens incentives for innovators. "It would encourage highly leveraged bids, and that expense would be passed on to the consumer in higher rates," Schelle added. ◘

Banking on networks for electronic check payments

Concept growing, speeds payment, cuts costs.

By Jim Brown
Senior Editor

SAN FRANCISCO — Banks are becoming increasingly interested in using networks to electronically request check payments from other banks instead of sending off the actual paper check, according to attendees at the National Automated Clearing House Association (NACHA) 91 show here last week.

Known as check truncation, the concept promises to speed check payment and cut in half the cost of exchanging payment requests by eliminating the transportation of paper checks.

The concept, which has been in limited use for several years, gives banks an interim tool they can use until imaging systems that enable banks to exchange digitized check images become more affordable.

"Image is the technology that everybody is waiting on to truly eliminate the transportation of paper checks," said David Kvederis, senior vice-president at Wells Fargo Bank, N.A. here.

But until the cost comes down on imaging systems and the high-speed transmission facilities needed daily to transmit millions of check images — each of which ranges in size from 25K to 50K bytes of data — banks will increasingly rely on truncation, the transport of bulk data files to request payments.

With truncation, banks capture information from the magnetic ink character recognition (MICR) line along the bottom of checks as they pass through a reader/sorter machine. The MICR line details the amount of the check, the bank it was drawn on and the checking account number. Banks encode the check amount on the MICR line after they have been cashed.

MICR data is used to create a file that is transmitted over leased or dial-up lines to one of four automated clearinghouses (ACH). The ACH sorts the files, compiles data destined for specific institutions and then downloads those files to the banks. The whole process takes about a day to complete, compared with the two or three days required with traditional check processing.

Traditionally, after a bank cashes a check, it sends it to a clearinghouse, which then forwards it to the bank holding the account. Checks are fed through reader/sorter units at each stop in this process.

In check truncation, the bank that cashed the check passes it through a reader/sorter once and keeps the paper on file for up to 90 days, after which a microfilm copy is generated and the check is thrown away. The key is to get check issuers to agree to accept a printed statement that details check numbers and the amount of each check in place of receiving the actual checks.

There are two ways to identify a check that can be truncated. One is to examine the customer's

(continued on page 71)

Banks to test electronic rebate check clearing

SAN FRANCISCO — The Federal Reserve Bank of Minnesota and as many as 10 other banks this year will test an emerging electronic funds transfer standard that promises to drastically reduce the number of low-value checks traversing the nation's check clearing system.

The demonstration, detailed at the National Automated Clearing House Association (NACHA) 91 show here last week, is targeted at reducing the cost of clearing manufacturer rebate checks.

In the test, an emerging electronic funds transfer standard called TRX will enable banks that have cashed these checks to electronically request the manufacturer's bank to pay them.

Typically ranging in value from 50 cents to $5, the checks cost banks between 4 and 5 cents each to transport through the check clearing system.

The cost for processing these checks electronically could drop to 1.7 cents each, said Ted Umhoefer, vice-president in charge of check operations at the Federal Reserve Bank of Minnesota.

An estimated 55 million to one billion checks are eligible to be truncated in the test, Umhoefer said.

If successful, the test will be expanded by year end to include other types of checks such as consumer checks. Based on the results of these tests, NACHA could approve the TRX format as a standard by 1992, thus making it available for widespread use.

— Jim Brown

Sporadic Infonet E-mail outages pester some users

Notice messaging service shut down multiple times in past two weeks, but problems fixed now.

By Barton Crockett
Senior Editor

EL SEGUNDO, Calif. — Problems with one of the five processors supporting Infonet Services Corp.'s flagship electronic messaging offering has interrupted service for as many as 50 companies during the past two weeks.

Hardware troubles with a Unisys Corp. mainframe and front-end processor used to support Infonet's Notice messaging service forced the company to shut it down for at least eight hours last week and several times two weeks ago, according to Infonet officials.

The network manager for an Infonet customer who requested anonymity said the outage disrupted communications for about 400 to 500 of his firm's employees during the past two weeks.

He personally tried to log onto Notice from March 4 to 6 and again several times on March 11 and 12 but was never able to get through. He said some intracompany file transfers were delayed by a week.

The source added that managers within his company are particularly upset because the firm expects to make a major purchase of international communications services and was considering using Infonet, which is based here.

Now "the opinion of Infonet here is very low," the network manager said.

Infonet officials admitted to having some technical problems but described the outage as relatively minor.

According to Randy Lintecum, Infonet's vice-president of marketing and business development, the company experienced two problems with Notice during the past two weeks.

The first problem, which began March 4, involved a front-end processor for one of the five Unisys mainframes supporting Notice.

These hosts reside in data centers on the East and West coasts and receive messages via Infonet's international, X.25-based public data network.

Lintecum said that between March 4 and 8, three cards in the Unisys front end failed.

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Notice supports electronic mail, file transfer, facsimile and telex transmission applications.

Lintecum said that between March 4 and 8, three cards in the Unisys front end failed and had to be replaced.

The card replacements resulted in 11 service interruptions between March 4 and 10, each of which lasted for a few minutes at most.

These interruptions cut off Notice service to users who were logged on when the interruptions occurred and who were served by the mainframe connected to the front-end processor.

Lintecum said the outage affected about 50 of the 1,000 companies that subscribe to the Notice service.

On March 11, Infonet discovered another problem, this time on the mainframe attached to the front-end processor, which forced the company to shut down the mainframe from approximately 11 p.m. to 7 a.m. the following day.

For approximately 12 hours after that, Lintecum said Infonet was running the mainframe under what is called "managed load," in which access to the mainframe is restricted.

All of the subscribers served by the host would have lost Notice service when it was shut down, and some of them would have experienced slow response time or outages when the mainframe was running under managed load, Lintecum said.

Although the network manager with the Fortune 500 company that was badly affected said he thought Lintecum was understating the extent of the outage, other Notice users said they were not significantly impacted.

For example, Ranbeer Johal, personal computer support analyst at Waste Management, Inc.'s London office, said Infonet service to his office was cut off for the entire business day on March 12.

But Johal added that no one suffered greatly from the interruption.

Rich Pawlicki, director of MIS at Culligan International Co. in Northbrook, Ill., said Notice service to his company was never interrupted and that his firm has a good opinion of Infonet.

Eric Arnum, editor of the industry newsletter "Electronic Mail and Micro Systems," published in New Canaan, Conn., said outages of the degree described by Lintecum are rare. He added that Infonet has "an Avis [Inc.] 'we try harder' " reputation and that he was surprised that an Infonet customer was affected so badly. ☐

Siemens expected to add CMIP to IBM-HP OSF plan

By Caryn Gillooly
Senior Editor

PALO ALTO, Calif. — Siemens Nixdorf Informationssysteme AG this week is expected to throw its support behind a proposal offered by Hewlett-Packard Co. and IBM to develop a comprehensive management system for the Open Software Foundation's (OSF) Distributed Management Environment (DME).

The proposal, unveiled to the OSF late last year, is a model for a protocol- and platform-independent net management system that will monitor and control networks, systems and applications. The proposal was offered in response to an OSF request for technology (RFT).

Siemens will not only support the HP-IBM proposal, but it will also provide the two companies with an Open Systems Interconnection Common Management Information Protocol (CMIP) component for inclusion in the proposal. This will round out the group's standards support since the original proposal only supported the Simple Network Management Protocol (SNMP).

Siemens' entrance brings the number of companies in the HP-IBM camp to four — Group Bull SA had previously announced support for the proposal.

"HP and Bull cooperated on a [common] application program interface; Siemens is bringing in the CMIP component; and IBM is contributing a character-based user interface, fault tolerance and systems management applications," said Jeff Thiemann, market development manager for HP's OpenView program in Fort Collins, Colo.

HP is contributing the SNMP component from its HP OpenView net management product.

"The proposal brings all these

(continued on page 70)

Vendors display DCE, OSI projects in CeBIT demos

Users disappointed by lack of OSI product rollouts.

By Bob Brown
Senior Editor

HANNOVER, Germany — Distributed computing applications and Open Systems Interconnection migration strategies took center stage here last week at the Hannover Fair CeBIT '91 trade show, but users said vendors are still not bringing OSI products to market fast enough.

HANNOVER FAIR
CeBIT '91

More than a half million visitors took in CeBIT's 4,500-plus exhibits, including 170 vendor booths in a hall dedicated entirely to networking.

Attendees flocked to five exhibits hosted by vendors demonstrating a network application based on the Open Software Foundation's (OSF) Distributed Computing Environment ("Five vendors to showcase DCE application at CeBIT," *NW,* March 11). Digital Equipment Corp., Group Bull SA, Hewlett-Packard Co.'s Apollo Systems Division, IBM and Siemens Nixdorf Informationssysteme AG teamed up with OSF to develop the application.

"We hope this demonstration will encourage independent software developers to begin building applications designed for distributed networks," a Siemens official said.

Aside from the DCE demo, multivendor interoperability demonstrations — a CeBIT tradition — were basically nonexistent at the trade show, largely because vendors did not want to pay to participate in them, a CeBIT spokesman said. Attendees, however, were not fazed, saying they would prefer to see OSI product rollouts.

"The demonstrations have become somewhat 'old hat,' " said Harald Nottebohm, head of the data communications department at Hoechst AG, a giant chemical company based in Germany. "What we need now are products. Enough of the demonstrations."

At least one user at the show applauded the DCE demo. Paul

(continued on page 67)

Corrections: The story "SNA net helps cities collect parking fines" (*NW,* March 11) contained two errors. The number of parking tickets processed by Lockheed Information Management Services Co. in 1990 was 17.5 million. Also, the company has more than 40 million records in its data base.

Teknekron Infoswitch Corp.'s name was misspelled in "Aspect winning converts in competitive ACD mart" (*NW,* Feb. 18).

Retix announces X.400, X.500 OSI source code

By Ellen Messmer
Washington Correspondent

SANTA MONICA, Calif. — Retix last week rolled out new Open Systems Interconnection source code for the 1988 X.400 Message Handling System (MHS) and X.500 Directory Services.

The Retix X.400 and X.500 source code will enable users, systems vendors and OEMs to develop OSI applications for various vendor systems.

The announcement of the code could lead to the introduction of a slew of end-user products in the near future, according to analysts.

Sayuri Tung, marketing director of the OSI technology unit at Retix, said a handful of vendors have already licensed the code, but she declined to reveal their identities.

X.400 is a standard for electronic mail, while X.500 is a standard for electronic messaging directories.

To date, only Siemens AG and Unisys Corp., which developed their own source code, have released X.500 Directory Services products.

Retix also announced that a group of vendors that resell its products on an OEM basis has formed the Retix User Group to provide the company with product feed back. Tung said she expects the group to focus on such issues as the need to create a library for OSI transport- and session-layer application program interfaces (API).

Tung noted that publicly available APIs would bring about less costly and more flexible software development. The group of 29 vendors from Europe, North America and the Far East is chaired by Gerry Segal, project manager of network services for Hitachi Computer Products.

Segal said the vendor-based Retix User Group intends to seek end-user comment as well. The group is also preparing a formal response to the "Barriers to Open Systems" report issued by the User Alliance for Open Systems as a challenge to users and vendors, Segal added.

"As a community of vendors, we want to respond to the needs and concerns of the end user," he said. ☐

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

> "Microsoft [Corp.'s] acquisition of Consumers Software [Inc.] and Lotus [Development Corp.'s] acquisition of cc:Mail [Inc.] will lead to an expanded E-mail market and improve on today's clumsy integration of applications with mail."
>
> **Javier Rojas**
> Senior associate
> Broadview Associates
> Fort Lee, N.J.

People & Positions

Roy Wilkens, president of the long-haul carrier **Williams Telecommunications Group, Inc.**, recently was elected chairman of the **Competitive Telecommunications Association (CompTel).** Wilkens replaces **Alan Peyser**, president of **Cable & Wireless Communications, Inc.**, as head of the long-distance carrier trade organization.

Richard Jalkut has been elected president and chief executive officer of **New York Telephone Co.** Jalkut, who was executive vice-president and chief operating officer of the Bell operating company, succeeds **Frederic Salerno,** who has become vice-chairman and president of worldwide services for **Nynex Corp.**

Infotron Systems Corp. recently named **Gerry Chastelet** as vice-president of North American operations. Chastelet will be responsible for sales, service, marketing and business planning activities in the U.S. and Canada. He will also continue to serve as president of Infotron Canada, Ltd., a position he has held since joining Infotron in 1989. ◻

AT&T cries foul over US Sprint award for FTS 2000

Claims secret talks lured away Navy and Marines.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — AT&T is protesting a decision to place the U.S. Navy and Marine Corps on US Sprint Communications Co.'s portion of the federal government's Federal Telecommunications System (FTS) 2000 network, claiming the rival carrier won the award through secret negotiations.

In a protest filed with the U.S. General Services Administration's Board of Contract Appeals, AT&T claimed US Sprint agreed to lower its FTS 2000 pricing in return for moving the services' traffic from AT&T's portion of the FTS 2000 network to US Sprint's. AT&T officials said they did not know whether US Sprint lowered its prices across the board or only for the military groups.

AT&T claims the GSA's decision to move the traffic off AT&T's network violates provisions of the FTS 2000 contract because it was, in effect, a sole-source award. AT&T said it had no opportunity to rebid a lower price to keep the Navy and Marine Corps business.

In addition, AT&T said the award undermines the 60-40 revenue split envisioned by Congress when the contract was divided between two bidders. AT&T won 60% of the contract, while US Sprint won 40%. Initially, FTS 2000 was to have been awarded to one carrier, but the contract was split by Congress to keep the carriers more competitive.

AT&T claims that even before it lost the Navy and Marine Corps business, the revenue split between the two carriers was almost exactly reversed, with US Sprint receiving 57% of the network's revenue and AT&T receiving 43%. AT&T officials declined to say how much further the revenue split will be skewed by the loss of additional traffic.

FTS 2000 has been plagued by controversy and delays that first centered on the bidding process and contract award and that now revolve around the GSA's handling of operational details such as pricing, billing and adding new network services. The contract, which could be worth $25 billion over 10 years, is for the upgrade of the government's antiquated telephone network to a digital, fiber-optic system.

Adding to that are the political struggles GSA has encountered

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INDUSTRY BRIEFS

NATA, Bellcore meet to discuss net interfaces. The North American Telecommunications Association (NATA) and Bell Communications Research plan to host a meeting April 18 and 19 in Arlington, Va., for carriers, switch makers and computer manufacturers to discuss the need for standard interfaces linking computers and telephone equipment.

The objective of the meeting is to speed the development of standard interfaces by coming up with an industry consensus on base-line protocols and providing the information to standards-making bodies. For more information, contact Mary Bradshaw at NATA at (202) 296-9800.

3Com users wooed by cc:Mail. The company that holds the largest share of the local-area network electronic mail market, cc:Mail, Inc., recently announced two incentive programs to speed the migration of users from 3Com Corp.'s 3+ and 3+Open mail offerings.

The incentive programs follow a recent agreement between cc:Mail and 3Com under which 3Com will reference sell cc:Mail's E-mail packages. 3Com will continue to sell and support its own mail offerings but will reference sell cc:Mail to users seeking protocol independence or enhanced functions.

One incentive program calls for cc:Mail to provide one free Post Office Pack for DOS (administration and eight users) for each server version of 3Com mail converted. The second program enables users converting 500 or more 3Com mail users to cc:Mail to get one free cc:Mail mailbox for every three 3Com mailboxes converted. ◻

What's new in GOSIP Version 2

- Virtual Terminal service
- Office Document Architecture
- ISDN
- End System-to-Intermediate System protocol

Options:

- Connectionless Transport Service
- Connection-Oriented Network Service

SOURCE: NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, GATHERSBURG, MD.
GRAPHIC BY SUSAN J. CHAMPENEY

GOSIP 2 may drive vendors to back ODA

Despite lack of interest in document management spec, GOSIP mandate could spark user demand.

By Ellen Messmer
Washington Correspondent

GAITHERSBURG, Md. — The U.S. government is expected to soon announce Government Open Systems Interconnection Profile (GOSIP) Version 2, including a provision to support the Office Document Architecture (ODA) standard, which will prod vendors to hammer out a common plan to support ODA in OSI networks.

To date, vendors have haggled over minute details of ODA, a specification designed to facilitate the exchange of text, graphic and image documents among disparate systems, regardless of inconsistencies in proprietary document formats.

Under GOSIP Version 2, the National Institute of Standards and Technology (NIST) would like ODA communications features to be embedded into X.400 electronic messaging and File Transfer, Access and Management (FTAM) products in users' OSI nets.

Many analysts, and even vendors, said a mandate for ODA in GOSIP 2 would effectively light a fire under the vendor community to deliver the capability to federal agencies within 18 months after GOSIP 2 is announced. This would ultimately make the technology available to commercial users as well.

"Government RFPs spur development," said Phil Wimpenny, a program development manager at Unisys Corp. "Otherwise, we sit around the table and debate ODA."

Few vendors have brought ODA-based products to market; Unisys, in fact, is one of the few. Instead, as vendors argue over technical aspects of the specification, some vendors have taken a different tack, choosing to release products containing their own document management architectures.

Vendors argue that they are forced to take proprietary paths because U.S. network managers are not demanding ODA in substantial numbers.

"The business case for ODA is still unclear," said Frank Dawson, a programmer in IBM's data stream, architecture and standards group, and head of NIST's ODA Workshop.

Representatives from Digital Equipment Corp., IBM and WordPerfect, Inc. said customer demand for ODA has come primarily from Europe.

But lack of customer demand is only one issue vendors raise; some also debate the capabilities provided by ODA.

> A mandate for ODA in GOSIP 2 would light a fire under the vendor community.
>
> ▲▲▲

"Some argue that ODA is not enough, [and] some say ODA is too much," said Al Nugent, director of software architecture at Group Bull SA in Paris, which plans to outline next month its course of action regarding ODA.

Sources at WordPerfect said they plan to make a statement of direction concerning ODA within the next month as well.

DEC, on the other hand, is one vendor that believes ODA is not comprehensive enough. Lynda Rouzee, marketing manager for DEC's Compound Document Architecture (CDA), noted that

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AT&T cries foul over US Sprint award

continued from page 9

trying to get all federal users onto the network. The Department of Defense has been particularly recalcitrant, saying it does not believe FTS 2000 can support its security needs.

Congress has also opted out of the contract and signed a deal with MCI Communications Corp.

The protest, filed by AT&T, is the first major rift between the two FTS 2000 providers, and it raises fundamental questions about how the contract is being managed. One source who is familiar with the deal and who requested anonymity said the contract language is often vague, making it unclear how the GSA intended to monitor and maintain the 60-40 split or even if that is a mandate.

The GSA assigns agencies to the two vendors' networks and is responsible for maintaining the 60-40 split. It is allowed to move agencies from one carrier to another, but the aim is to keep the 60-40 balance, AT&T said.

The protest, filed by AT&T, is the first major rift between the two FTS 2000 providers.

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A US Sprint spokeswoman denied any improprieties in winning the Marine Corps and Navy business and is referring all inquiries to the GSA. The carrier also questions AT&T's assertion that the GSA has mishandled the 60-40 contract split.

In a prepared statement, US Sprint said it is not aware of the percentage of the contract revenue it is currently receiving. However, it believes the 60-40 split was only a goal of the GSA and not a mandate.

The GSA declined to comment on the protest or 60-40 split other than to refer to information in a prebid document prepared in 1987 by the agency to answer bidders' questions.

"The 60-40 split is based on February 1986 FTS traffic data and represents the government's best estimate of the traffic ratio at the time of implementation. It is a target, not a guarantee," the GSA said at the time.

But an AT&T spokesman said that since the contract was awarded in 1988, GSA has indicated verbally and in writing that AT&T is entitled to 60% of the network revenue from FTS 2000 for the duration of the contract.

Even if AT&T is correct in asserting that the 60-40 split is not being maintained, US Sprint says differences could be due to marketing efforts.

"We have been aggressive in moving traffic onto the [FTS 2000] network, securing contract modifications to ensure that developing technologies will be accommodated on the network and in marketing the new advanced technologies in general," US Sprint said.

It is widely believed by industry observers that US Sprint's FTS 2000 rates are somewhat higher than AT&T's. Additionally, if US Sprint has sold a greater number of expensive services than AT&T has, it is possible that US Sprint would be getting more revenue from the net than AT&T is.

According to AT&T's protest, the GSA awarded all of the military departments, including the Navy and Marine Corps, to AT&T on May 8, 1990. AT&T said it had already received orders for service from each of those groups. The value of the service from the military groups was estimated at $60 million.

Between May and October, AT&T claims that US Sprint entered secret negotiations with the GSA to win the Navy and Marine Corps traffic. On Oct. 15, 1990, AT&T said the GSA notified it that the military groups were being switched to US Sprint. ◪

GOSIP 2 may drive vendors to back ODA

continued from page 9

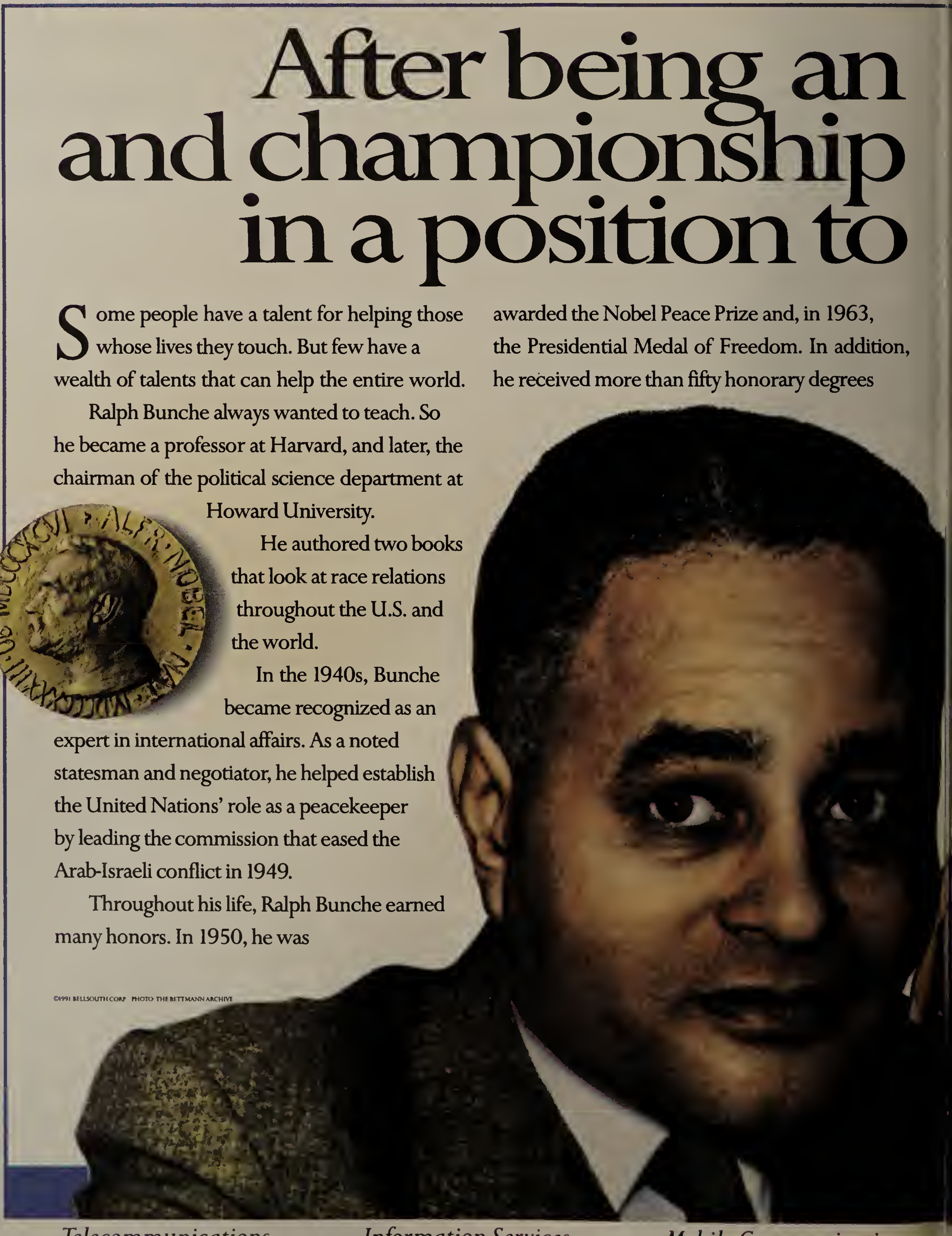
ODA, however important, does not include provisions to support spreadsheet data.

ODA was developed more than seven years ago. "It hasn't kept up with the dynamic developments in desktop publishing," Rouzee said.

As an alternative, DEC developed its CDA as an open specification, which has been adopted by several vendors including Access Technology, Inc. and Lotus Development Corp.

But Rouzee said DEC plans to support ODA and will officially announce in May its first ODA product, the DEC ODA-CDA Gateway. The first version, which will operate on DEC VMS minicomputers, is currently being field-tested at The Boeing Co.

Vendors such as DEC contend that ODA offers only a subset of document interchange features that companies offer on their own document management systems. Consequently, DEC is likely to market its existing document interchange products for pure DEC shops and provide ODA conversion tools to hook its proprietary document management system into ODA environments. Analysts predict that other vendors will follow suit and that ODA conversion tools will dominate the market long before products that fully support ODA are available. These tools will be built into vendor text/graphics processing sys-



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Ralph Bunche always wanted to teach. So he became a professor at Harvard, and later, the chairman of the political science department at Howard University.

He authored two books that look at race relations throughout the U.S. and the world.

In the 1940s, Bunche became recognized as an expert in international affairs. As a noted statesman and negotiator, he helped establish the United Nations' role as a peacekeeper by leading the commission that eased the Arab-Israeli conflict in 1949.

Throughout his life, Ralph Bunche earned many honors. In 1950, he was awarded the Nobel Peace Prize and, in 1963, the Presidential Medal of Freedom. In addition, he received more than fifty honorary degrees

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Telecommunications *Information Services* *Mobile Communications*

tems or offered as stand-alone software, and they will convert documents supporting proprietary formats into ODA format.

"By virtue of necessity, conversion tools are going to be a key requirement for vendors to get their customers up to speed with this new technology," Nugent said.

Still, the mere insistence of ODA within GOSIP Version 2 will be enough to accelerate availability of the technology to users in the government and commercial sectors, according to Edwin Mier, president of Mier Communications, Inc., a Princeton, N.J., consultancy.

"If anything makes OSI succeed, the GOSIP program will because the U.S. government is the largest procurer of software in the world," Mier said. ◘

PictureTel will use dealers to key in on smaller business market

By Barton Crockett
Senior Editor

PEABODY, Mass. — PictureTel Corp. announced last week that it will broaden its product distribution strategy and use independent dealers to sell its videoconferencing systems to small and midsize businesses.

The use of dealers marks a major departure from PictureTel's current policy of relying primarily on a direct sales force. Company officials said the change will enable PictureTel to devote more resources to the small businesses, which to date have been limited users of videoconferencing.

"One of the things we'll be able to accomplish is to push the application of videoconferencing down below the Fortune 500," said Michael Hickerson, PictureTel's vice-president for U.S. sales.

Hickerson said large companies will benefit from the expansion because they will have more firms with which to conduct videoconferences.

"Large firms will be able to hold videoconferences with their lawyers, accountants and other small business partners," he said.

PictureTel will set up the dealer system with North Supply Co., a wholly owned unit of United Telecommunications, Inc. based in Industrial Airport, Kan. North Supply, which posted revenue of $572 million last year, purchases telecommunications and security equipment from manufacturers and resells it to independent dealers.

PictureTel and North Supply said that during the next year, they will select 15 to 20 independent dealers from around the country to sell PictureTel's new System 4000 videoconferencing unit as part of a portfolio that includes other network gear ("Videoconferencing system packs clear audio, low cost," *NW*, Jan 28).

Dealers will actually purchase the System 4000s from North Supply, which will spend approximately $1 million to acquire about 35 System 4000s from PictureTel.

Additionally, PictureTel's sales force will retain exclusive rights to sell the company's videoconferencing systems to the Fortune 500 and the 500 largest service companies in accordance with their contract with the selected dealers.

> The strategy "symbolizes the move videoconferencing is making, from being a toy for the executive to being a meat-and-potatoes product for the mainstream."
>
> ▲▲▲

PictureTel officials said they can use independent dealers now because they have much higher profit margins on their new System 4000, which was introduced earlier this year. These margins enable PictureTel to offer independent dealers and distributors steep discounts and still turn a profit.

Company officials said they would not have been able to offer sufficient discounts to interest dealers in the older C3000 video coder/decoder and V3100 videoconferencing system.

Mixed analyst reaction

Analyst reaction to the new distribution setup was mixed with some praising the arrangement.

"I think this is more than just another dealer arrangement," said Robin Rather, director of future technology at Information Strategies Group in Vienna, Va. "It kind of symbolizes the move videoconferencing is making, from being a toy for the executive to being a meat-and-potatoes product for the mainstream."

But Roger Redmond, managing director at the Minneapolis investment firm of Piper, Jaffray & Hopwood, Inc., disagreed.

"I am skeptical that these products can be sold through independent distributors at this phase of the market," Redmond explained.

He said videoconferencing systems are still too complex for independent dealers to sell successfully. Instead, he said the bulk of sales need to be made by a dedicated sales force. ◘

author, a professor athlete, he was finally change the world.

from colleges and universities around the world.

He once said that his most prized possessions were three gold basketballs, trophies which he received at UCLA where he was a starting guard on three consecutive Pacific Conference championship teams.

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FAM

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MILY

folio of products optimized for SONET. We based each network element on the same architecture—an end-to-end fiber network architecture, linked them with a common software, and designed them to share processors and interface modules. The S/DMS TransportNode provides interoffice and long-haul transport. The S/DMS AccessNode will deliver real-time broadband service provisioning to business and residential customers. And the S/DMS SuperNode will handle a full range of switched and non-switched services.

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S/DMS systems catch problems before they turn into disasters. So you aren't caught with your network down.

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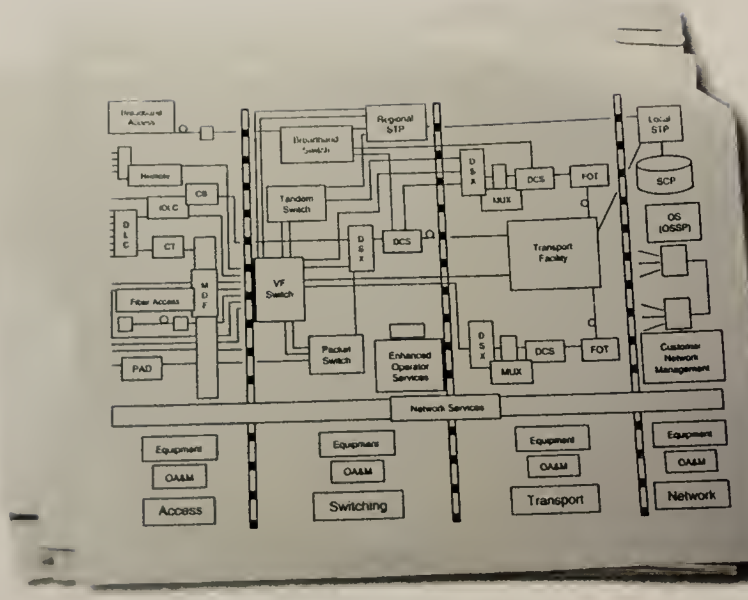

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You may think that a new technology like fiber has to complicate things. But that's simply not true.

Because a FiberWorld network will actually take away much more hardware from your network than it adds.

For example, the S/DMS TransportNode connects directly to DS-1. So you can plan to get rid

LICITY

of multiplexers and cross-connects. You can replace several fiber terminals at a hub with one S/DMS TransportNode, using S/DMS bandwidth management to handle the traffic. Or bundle lots of low-capacity spurs into a few high-capacity backbones.

Also, the S/DMS AccessNode connects directly to the S/DMS TransportNode and to the S/DMS SuperNode, eliminating much more equipment.

And besides helping you cut back on "boxes," we help simplify the equipment you do need. Common hardware reduces the amount of training your OAM&P staff needs to get up to speed on SONET. And common software makes connecting and maintaining it far less complex. Simple, isn't it?

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While you're cutting operating costs, you can be reducing capital outlays by simplifying your network.

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The multimedia, personal communications services you deliver through FiberWorld will drive the communications industry in the future, creating a platform for service innovation and significant new revenue generation.

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SURVIVABILITY.

SIMPLICITY.

VALUE.

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Call us today and let's talk.

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TELECOMMUNICATIONS

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Worth Noting

Ameritech Mobile Communications recently brought aboard its 300,000th mobile telephone service customer. That customer will be reimbursed for the cost of his telephone and receive one year of ree mobile telephone service.

Carrier Watch

As part of its 10-year, $2 billion "Indiana for the '90s" program, **Indiana Bell Telephone Co.** will spend $206 million this year to upgrade electromechanical switches in 24 communities and install more than 6,000 additional miles of fiber-optic cable in its network.

The Bell operating company has spent more than $1 billion upgrading and expanding the reach of its network during the past five years, according to a company spokesman.

All 164 of Indiana Bell's central offices are scheduled to have analog or digital electronic switches by the end of September. Electronic switches enable the BOC to offer advanced services including call waiting, call forwarding and automatic callback.

Much of the fiber to be installed this year will provide physically diverse routing between its central offices.

AT&T's Network Systems Group, Fujitsu Network Switching of America, Inc., Siemens Stromberg-Carlson and **US West Communications, Inc.** plan to announce a joint network technology trial called Communications Programs for Advanced Switched Services on March 19 at the Supercomm '91 trade show in Houston. A US West spokesman said the trial will involve frame relay, Switched Multimegabit Data Service and other emerging technologies.

Staving off the competition

Ways local exchange carriers can ensure the loyalty of midsize companies

- **Focus** on customer service. Upgrade service across the board to provide more personal contact, faster repairs and delivery, and more readable and summarized billing.
- **Acknowledge** customer sensitivity to service outages and work to provide superior repair services and redundant routing to minimize downtime.
- **Help** customers explore new technologies and keep them abreast of the latest information on new products and services.

SOURCE: ANDERSEN CONSULTING, TELECOM INDUSTRY GROUP, ATLANTA
GRAPHIC BY SUSAN J. CHAMPENY

LECs must improve service to compete in middle mart

Dissatisfied users consider alternative carriers.

By Maureen Molloy
Staff Writer

PHOENIX — Local exchange carriers must vastly improve service quality if they hope to prevent alternative carriers from stealing accounts, according to a recently released survey of 200 midsize businesses.

More than 60% of those surveyed said they would like to see widespread competitive alternatives to the local exchange carriers within the next two years. While most rated the local exchange carriers' pricing and transmission quality on par with alternative carriers, nearly half of the respondents pointed out disparities among carriers' services and maintenance levels.

"Clients are clearly unhappy with the service they're getting, so the way a given carrier can differentiate itself and gain a competitive advantage in today's market is to focus on customer service," said Alan Burgess, worldwide managing partner of Andersen Consulting's Telecom Industry Group. "Those carriers who can provide the right service for their customers' business are the ones who'll profit."

The survey results were presented recently at Andersen Consulting's annual Customer Contact Forum for executives of telephone and wireless communications companies.

Telephone companies have done a thorough job of meeting the demands of their largest corporate customers because they are the ones who provide most of the carriers' revenues, said Peter Bott, managing partner of strategic services at Andersen Consulting. But large customers have also demanded lower prices, which has resulted in lower profit margins for the carriers. Thus, competition is emerging in the middle market, he said.

Alternative access providers have targeted the private-line market, driving down private-line costs by 25% to 50%, and are now even seeking permission to offer service in the public switched market.

"When a LEC loses a dollar of revenue to an alternative carrier, it's essentially lost 80 cents of profit since [private-line service] is a fixed-cost business," he said.

To stem the alternative access providers' penetration of the local exchange carrier industry, Bott said, carriers must revamp their view of customer service.

"Carriers, to their detriment, have tended to view middle customers as one vast homogenous market, but if they want to remain competitive, they must address the market in a more segmented fashion," he said.

> "Carriers have tended to view middle customers as one vast homogenous market."

▲▲▲

Service must be targeted at the particular customer's most pressing needs in order to have a significant impact, he added.

The middle market consists primarily of three types of customers: companies at the high end of the middle market, customers for whom telecommunications is critical to their revenue-generating capacity and technically sophisticated users.

In each segment, the carriers

(continued on page 14)

Users voice concerns about Computer III

Decry rationale behind FCC plan to let the RBHCs offer enhanced services through telephone units.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The FCC has come under sharp criticism for its effort to reinstitute rules that would allow the RBHCs to provide enhanced services through their telephone units rather than through separate business units.

In comments filed with the Federal Communications Commission, users said they fear the regional Bell holding companies will engage in anticompetitive behavior and cross-subsidies if the agency proceeds with its proposal. This could lead to rival providers being driven out of the market, which may result in fewer service choices and higher prices.

In 1986, the commission decided to end its rules requiring the RBHCs to offer enhanced services through separate subsidiaries in a proceeding known as the Third Computer Inquiry. The agency also decided to preempt the states' authority to regulate enhanced services, even those provided only on an intrastate basis.

The Computer III decision was appealed and slowly made its way through the court system until last June, when a federal appeals court in San Francisco overturned the decision. The court said the FCC's decision to lift the separate subsidiary requirement was arbitrary and capricious because the agency failed to collect enough evidence to justify its order. It also said the FCC overstepped its authority in regulating intrastate services.

Since that order, the FCC has opened a proceeding to reinstitute its Computer III rules with added accounting safeguards and improved auditing and administrative procedures.

Users last week raised concerns about virtually all of the Computer III rules that the FCC is attempting to reinstate. They questioned whether it is appropriate to rely on accounting procedures to prevent improper business activities of the RBHCs and also said the FCC has fallen short in its analysis of the issue.

The International Communi-

(continued on page 14)

WASHINGTON UPDATE

BY ANITA TAFF

Teleport is largest bypass service provider. According to a report released recently by the Federal Communications Commission, the largest alternative access provider in the U.S. is New York-based Teleport Communications Group.

The report said that Teleport, which operates in 17 cities, had 273.2 route-miles of fiber installed in 1990 — 125 more route-miles than its nearest competitor, Institutional Communications Co. Metropolitan Fiber Systems, Inc. (MFS), another national alternative provider, had 84.1 miles of fiber installed in 1990. The gap between Teleport's and MFS' network size narrowed, however, when measured by fiber miles — the number of actual miles of fiber within multifiber cables. In 1990, Teleport had 15,519 fiber miles, compared with MFS, which had 12,154 fiber miles.

Ameritech licensed to experiment with PCN. The Federal Communications Commission recently granted Ameritech an experimental license to test a personal communications network (PCN) system. PCN is a wireless technology that uses low-power transmission technology known as spread spectrum.

Ameritech plans to conduct its test in Chicago using as many as 1,000 PCN portable phones and 100 transmission cells.

The carrier intends to test three services — one-way outbound calling, one-way calling integrated with pagers and two-way voice — and possibly data calls.

LECs must improve service to compete

continued from page 13

need to do a much better job of providing good customer contact, Burgess said. The survey indicated that good customer service is what users craved most and what telephone companies were most harshly criticized for not adequately providing.

"The middle customers want to see improvements in personal contact with telco account managers in terms of frequency, reach and, most importantly, quality," Bott said.

He added that most customers believe that their carrier representatives are not knowledgeable about their customers' business and are not conversant with the prices and tariffs of products and services.

Customers of alternative access providers, however, rated their representatives highly on both price and service. This discrepancy in service, Bott said, has caused many customers to migrate to alternative providers.

Companies at the high end of the middle market were identified as being most at risk to competition because they have the economic muscle to demand service similar to those in the large business market.

Burgess said local exchange carriers should focus on this segment first by providing premium service in all areas, which, in addition to giving good customer contact, includes such things as repairs, provisioning and billing.

Customers that rely on telecommunications as a lifeline, such as some financial institutions, are most sensitive to service outages and, therefore, require highly reliable networks and quick repair service.

Technically sophisticated users need to be at the leading edge of technology and, thus, depend on knowledgeable service representatives who can keep them abreast of new products and services.

"The solution to providing good customer service to the middle market is not simply to provide gold-plated service across the board because the phone companies have far too many customers to do that," he said. "You must identify each customer's vital needs and focus on them." ◻

Users voice concerns about Computer III

continued from page 13

cations Association (ICA) and the Ad Hoc Telecommunications Users Committee both questioned the validity of the FCC's primary justification for lifting the separate subsidiary requirement, which is: The FCC believes that depriving the RBHCs of economies of scale made possible by offering enhanced services from integrated business units will damage the widespread availability of those services.

Just an illusion

But, according to the ICA, "Many of the purported benefits of removing structural separation are illusory." The group contends that the 1986 market analysis the FCC used to justify eliminating separate subsidiaries is no longer valid.

"Only by reexamining the question of economies of integration can the commission hope to persuade a reviewing court of the reasonableness of its cost/benefit analysis — that the risk of loss of ratepayer benefits that would exist under structural separation are outweighed by the increased costs and loss of economies which structural separation would impose on the LECs," the ICA said.

The Ad Hoc Committee voiced the same concerns. "Dramatic technological and market developments have occurred over the past five years," the group said. It pointed out that newly implemented technologies, such as Signaling System 7, have allowed carriers to move intelligence out of the central office and into remote data bases. This calls into question the FCC's earlier belief that the carriers could achieve cost efficiencies by offering regulated and unregulated services out of a common central office switch.

ICA also told the FCC that although the merit of eliminating separate business units for enhanced and regulated telephone services is questionable, there are clear advantages in maintaining separate business units.

The group said separate subsidiaries make it easier for regulators to monitor and detect occurrences of preferential purchasing or business practices. Separate business units also help prevent ratepayers from bearing losses of unregulated businesses, as well as prevent predation and anticompetitive business practices such as cross-subsidies.

"Despite the increased regulatory scrutiny promised by the commission for its policing of the [RBHCs], ICA believes that unacceptable levels of cross-subsidization and discrimination will continue to occur," the association said.

Users also questioned whether the FCC has the resources to prevent the RBHCs from engaging in improper business activities if they are allowed to offer enhanced and regulated telephone services through a single unit.

"ICA believes that the availability of adequate funding to enable the commission to enforce nonstructural safeguards is sufficiently in doubt that the commission should seriously consider the less costly alternative of structural separation," the group said.

The Ad Hoc Committee and ICA also claim that the FCC's accounting procedures and its Automated Reporting and Management Information System have flaws that will prevent the agency from catching anticompetitive behavior. ◻

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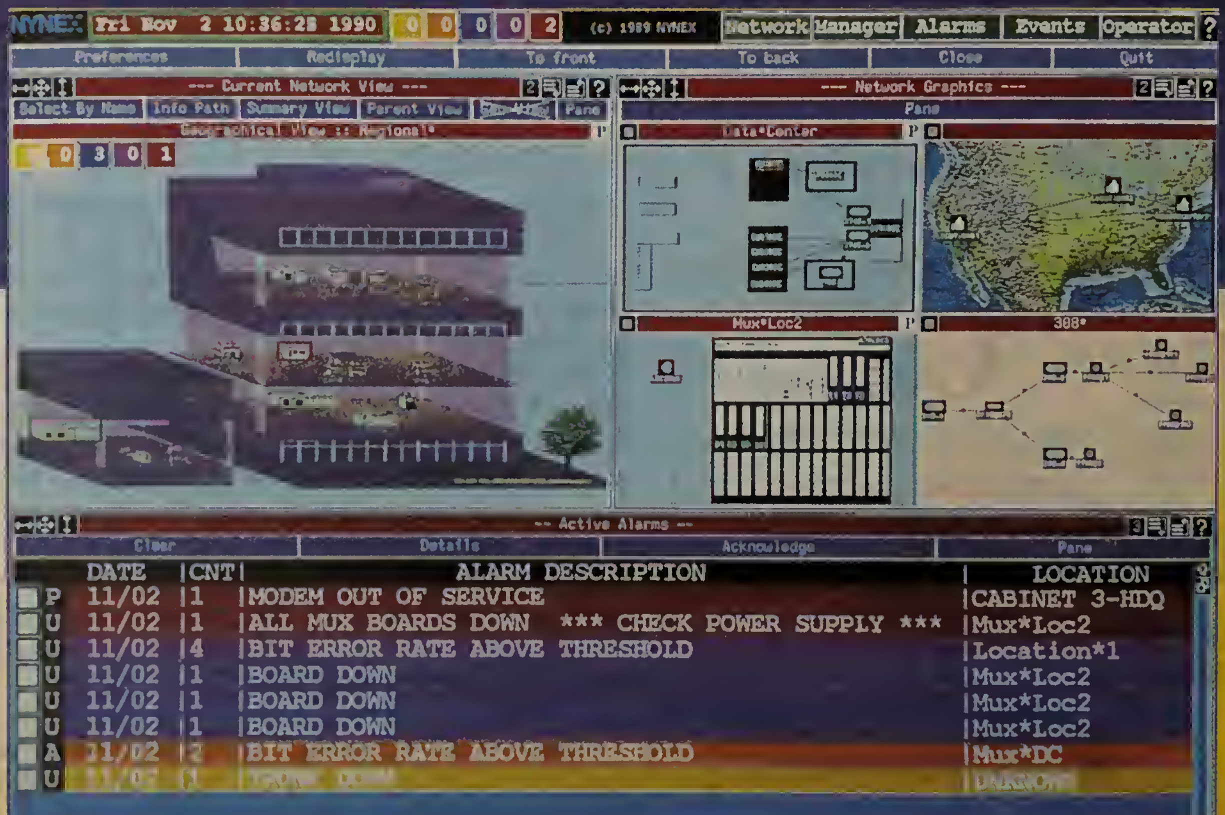

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  DATE  |CNT|               ALARM DESCRIPTION                  |   LOCATION
P 11/02 |1  |MODEM OUT OF SERVICE                              |CABINET 3-HDQ
U 11/02 |1  |ALL MUX BOARDS DOWN  *** CHECK POWER SUPPLY ***   |Mux*Loc2
U 11/02 |4  |BIT ERROR RATE ABOVE THRESHOLD                    |Location*1
U 11/02 |1  |BOARD DOWN                                        |Mux*Loc2
U 11/02 |1  |BOARD DOWN                                        |Mux*Loc2
U 11/02 |1  |BOARD DOWN                                        |Mux*Loc2
A 11/02 |2  |BIT ERROR RATE ABOVE THRESHOLD                    |Mux*DC
U [illegible]
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Circle Reader Service #106

DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

IBM said enhancements to the device drivers and LU 6.2 software provided with its new SAA Networking Services/2 software will make existing LU 6.2-based applications run at least twice as fast through the network with no changes to the application.

Data Packets

Effective this week, **AT&T** said it is expanding its Accunet Switched 56 service to Puerto Rico.

On the local end, a full T-1 link to an AT&T point of presence is required in order to access the service. The service will enable users in Puerto Rico to establish a 56K bit/sec switched link with other users on the island or with Accunet Switched 56 users in the U.S. in roughly four seconds.

The price of the service in Puerto Rico will be the same as the price for U.S. service.

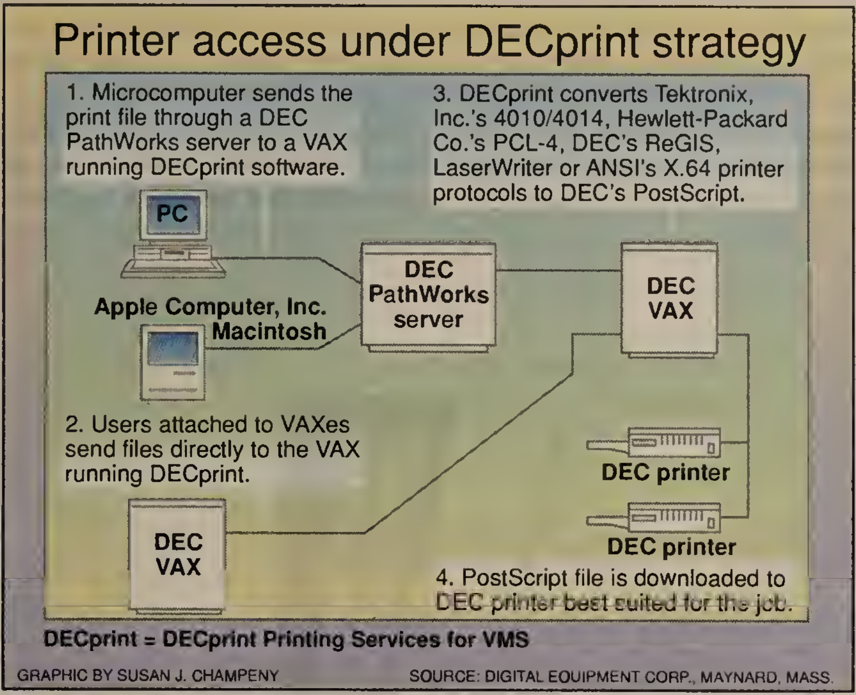
Primary Access Corp. recently announced a statement of direction to provide an Integrated Services Digital Network Primary Rate Interface (PRI) for its Primary Access network access system.

The Primary Access system is intended to reduce networking costs by concentrating separate lines onto a single, high-speed digital link.

The product's existing T-1 interface will be upgraded to support ISDN PRI. PRI will be supported via a software upgrade that adds an ISDN D channel server. The server will support as many as 20 T-1 links, the equivalent of 480 B channels.

The upgrade is scheduled for the end of 1991. Pricing has not been determined.

For more details, contact Primary Access at 10070 Carroll Canyon Road, San Diego, Calif. 92131; (619) 536-3000.



Printer access under DECprint strategy

1. Microcomputer sends the print file through a DEC PathWorks server to a VAX running DECprint software.

2. Users attached to VAXes send files directly to the VAX running DECprint.

3. DECprint converts Tektronix, Inc.'s 4010/4014, Hewlett-Packard Co.'s PCL-4, DEC's ReGIS, LaserWriter or ANSI's X.64 printer protocols to DEC's PostScript.

4. PostScript file is downloaded to DEC printer best suited for the job.

DECprint = DECprint Printing Services for VMS

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

DEC extends print services under DECprint strategy

Non-DEC computers can use printers on DECnet.

By Jim Brown
Senior Editor

BOSTON — Digital Equipment Corp. recently unveiled software that enables users of non-DEC computers to use DEC printers by converting print files to support DEC printing protocols.

DECprint Printing Services for VMS enables users to tap into existing DEC printers on a DECnet, rather than buying and maintaining printers dedicated for use by a handful of personal computers or workstations.

DEC also introduced DECfonts Typeface Collection, a set of 14 fonts it licensed from Adobe Systems, Inc. that will allow users attached to DEC minicomputers to include fonts in documents and transfer them as special PostScript files to printers or other users for viewing.

> "The bottom line is users need fewer printers to do the same job," said Howard Woolf of NAS and Electronic Publishing Systems.
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> ▲▲▲

Both products fall under DEC's DECprint architecture, which was introduced in 1989 and is part of DEC's Network Application Support (NAS) net application development guidelines.

DECprint Printing Services for VMS includes VAX-based client and server software as well as client software running under DEC's PathWorks for VMS software, which links IBM Personal Computers and Apple Computer, Inc. Macintoshes to a DECnet network. The new software enables applications running on DOS- and OS/2-based microcomputers, Macintoshes and VAXes to generate print files using local printer protocols such as Tektronix, Inc.'s 4010/4014, Hewlett-Packard Co.'s PCL-4, DEC's ReGIS, Apple's LaserWriter or ANSI's X.64.

DECprint Printing Services for VMS client software forwards print files to the VAX running DECprint Printing Services for VMS server software, which converts the printer protocol to DEC's PostScript implementation (see graphic, this page). That server then routes the document across DECnet to a local or remote DEC DEClaser, PrintServer, ScriptPrinter, LN03 Image Printer or ColorMate printer.

"The bottom line is users need fewer printers to do the same job," said Howard Woolf, manager of NAS and Electronic Publishing Systems.

The server component of DECprint Printing Services for VMS also supports printer management functions. It can, for instance, track print job status on different printers and detect which printers are experiencing problems, such as when they are out of paper. This enables the software to reroute print jobs around downed printers.

DECprint Printing Services for VMS replaces DEC's VAX ScriptPrinter and VAX PrintServer software, which do not support print files generated by microcomput-

(continued on page 18)

APPN for OS/2 not yet an SNA panacea

Required use of LU 6.2 could slow migration for 3270 users or force examination of alternatives.

By Paul Desmond
Senior Editor

While IBM's recent announcement of Advanced Peer-to-Peer Networking (APPN) support under OS/2 Extended Edition promises to simplify the task of building networks, APPN has some constraints that may make users slow to adopt it.

IBM's required use of its LU 6.2/Advanced Program-to-Program Communications (APPC) protocol with APPN could spook some users because LU 6.2's memory requirements make it prohibitive for use on DOS workstations.

Some users and analysts also said if IBM 3270 applications have to be retooled to work with APPN, that would also be the time to consider competing networking strategies.

But IBM is taking steps to ease the migration. For example, it is publishing some APPN specifications and lining up vendors such as Novell, Inc. to produce APPN-compliant products. Such products promise to ease concerns about LU 6.2 and provide a migration path from today's nets to distributed APPN-based nets.

The beauty of APPN is that nodes can be added, moved or removed from a network without having to update topology tables, which is a far cry from the system generation required in VTAM and IBM's Network Control Program (NCP) for traditional Systems Network Architecture nets. Also, in an APPN environment, data takes the optimum path through a network depending on traffic conditions, rather than relying on static routing tables stored in VTAM and NCP.

But some analysts said the fact that APPN works only with LU 6.2 is a major stumbling block. Others counter that APPN will fuel the growth of LU 6.2 because programming interfaces that come with SAA Networking Services/2 make it much easier to develop applications using LU 6.2.

"This was really targeted [by senior IBM executives] to be much more plug and play than anything they've ever released," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Wash-

(continued on page 19)

GE unit trials Networking Services/2 for imaging

EDEN PRAIRIE, Minn. — GE Capital Fleet Services (GECFS) here is using a beta version of IBM's new SAA Networking Services/2 software to enable customer service agents at OS/2 Extended Edition-based workstations to share image files with one another.

IBM's new Networking Services/2 — the vendor's Advanced Peer-to-Peer Networking (APPN) implementation for OS/2 Extended Edition — makes it easier for the company's MIS staff to write applications that can ship images from an Application System/400 minicomputer to a Personal System/2 running OS/2 Extended Edition, and from one PS/2 to another, said Larry Runge, director of advanced systems technology at GECFS.

The imaging project, now in the pilot stage, aims to replace paper invoices from the various automotive service stations with which GECFS does business as part of a maintenance program for cars it leases to corporate clients.

Less manual programming

The new APPN software reduces the amount of manual programming required to support applications based on IBM's LU 6.2/Advanced Program-to-Program Communications (APPC) protocol, which is the basis for the cooperative processing applications GECFS is deploying throughout its network.

The company already has APPC applications that work between PS/2s and a mainframe, and between PS/2s and an AS/400 ("GE seeks service edge via cooperative processing net," *NW*, Feb. 25). To do that, the company had to write a sig-

(continued on page 18)

DEC extends print services

continued from page 17

ers or Macintoshes and only work with DEC LN03 or PrintServer printers. Available next month, the software can be purchased separately for $1,300 or loaded on DEC printers with prices ranging from $3,049 to $5,849.

DEC's other introduction, DECfonts Typeface Collection, is software that resides on a VMS- or Ultrix-based VAX and enables users to view or print documents that include various type fonts. DEC worked with Adobe Systems to build support for the different fonts into the initial release. The two firms will add more fonts by releasing quarterly updates.

With DECfonts Typeface Collection, workstation-based electronic publishing applications use an application program interface (API) to request a particular font be downloaded to a workstation from the VAX. That font information is used to create a document. Details about which font was used to create the document are stored in the document file. This process enables workstations or printers receiving that document to request the appropriate font from the server.

Currently, font information must be stored on each workstation and printer. In order for a document created with a particular font to be displayed on another workstation or be printed properly, the receiving workstation or printer must have the same font information. Otherwise, the receiving workstation or printer will substitute one of its own fonts.

Only DEC's DECwrite and DECpresent applications support the API needed to access DECfonts Typeface Collection. But Datalogics, Inc., Frame Technologies, Inc., Interleaf, Inc., Microengineering Corp. and Xyvision, Inc. have agreed to add the APIs to their electronic publishing applications.

DEC said the software will be sold on a concurrent usage license basis in which a network manager can load the software onto a server and make it available to a limited number of users.

A single DECfonts Typeface Collection license costs $420 per concurrent user. ◘

GE unit trials software

continued from page 17

nificant amount of its own code, such as a unique terminal identification it built into the configuration file of each PS/2 so that APPC applications can identify partner physical units.

Although the terminal ID concern may seem like a minor one, it can snowball into a larger issue. For example, Runge said GECFS had to modify the OS/2 installation process to keep it from wiping out the terminal ID.

Networking Services/2 provides that terminal ID on its own along with the software required to let applications recognize the ID, Runge said.

"It's one less thing that the applications group has to build into the application," he said. "It's pretty exciting really, because this is another step toward true peer-to-peer communications. This will enable PC-to-PC communications to be done much easier than in the past."

That's an important consideration for the new imaging application, Runge added. The company wants its users, who are basically customer service agents, to be able to ship images from one PS/2 to another as they seek help from one another.

GECFS' image application will be closely tied with existing applications used in the company's maintenance management center. Most image applications today require parallel networks and separate terminals for image and traditional data applications, Runge said. That means any data that needs to be transferred from the image to another application must be entered manually.

With GECFS' image implementation, the same PS/2 that customer service personnel use for data applications will be able to make APPC calls to the AS/400 for image files as well as to display those files.

— *Paul Desmond*

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APPN for OS/2 not yet an SNA panacea

continued from page 17

ington, D.C. "It might stimulate people to use [LU] 6.2."

David Passmore, a partner with Ernst & Young's Network Strategies, a consultancy in Vienna, Va., said it's a given that over time, users will migrate from hierarchical, 3270-based applications to client/server and cooperative processing environments. What is less clear is whether SAA, OS/2 Extended Edition and APPN will be the foundation for that environment.

"If I'm going to have to rewrite my applications, might I want to consider TCP/IP or even OSI?" Passmore asked. "There's a lot of choices out there, and it's not clear that SAA is necessarily the best choice for many customers."

Robert Beckley, director of technology planning at Boston's Brigham and Women's Hospital, is building a distributed network out of about 50 bridged token-ring local-area networks with DOS clients and OS/2 servers. He said that using APPN and LU 6.2 in that environment, where there is no mainframe, would be "like using a 10-ton truck to deliver a postcard."

> Using APPN and LU 6.2 in an environment with no mainframe would be "like using a 10-ton truck to deliver a postcard."
>
> ▲▲▲

IBM's Network Basic I/O System or Named Pipes provide sufficient communications between OS/2 servers, Beckley said, although he acknowledged APPN's ease of configuration would be a plus.

Chip Steinmetz, vice-president of data processing at American Airlines Decision Technologies, Inc. in Fort Worth, Texas, said APPN memory requirements are a concern. "I've got 4M-byte PS/2 55 SXs running DOS, and we have multiple device drivers already loaded," Steinmetz said. "I don't have room for LU 6.2."

Beckley agreed. "An average LU 6.2 protocol stack is 256K. NETBIOS is about 25K," he said.

IBM will provide an upgrade for its 3174 cluster controller software to let DOS machines attached to the 3174 via coaxial cable participate in APPN nets. But the DOS machines must use LU 6.2.

Steinmetz said an alternative would be to dedicate a LAN server to provide LU 6.2 services to attached clients.

That is where third parties such as Novell come in.

Novell is one of four vendors that have announced support for the APPN end-node specification IBM said it will publish.

"Where we have the advantage is that we've implemented APPN on the server," said Gerry Machi, director of product marketing at Novell. "You need a very small piece of code on the workstation" to supply the programming interface to LU 6.2. That takes only about 20K bytes, he added.

That would let the NetWare server function as an APPN end node, meaning it could use LU 6.2 and communicate as a peer with any other node in an APPN net. End nodes rely on APPN network nodes, which contain network topology data, to supply them with routing instructions.

Systems Strategies, Inc. said it will enhance two products to support the end-node specification. The first is its Express software, which ties Unix machines to SNA nets, and the other is ezBridge, which provides the same functions for Digital Equipment Corp. Ultrix and VMS machines.

Apple Computer, Inc. said it plans to let Macintosh microcomputers attached to AppleTalk LANs function as APPN end nodes. And Siemens Nixdorf Information Systems AG will do the same for its Sinix/Unix computers.

A fifth company, American Management Systems, Inc., announced plans to use Networking Services/2 for its new MicroTradeLine product, which is a client/server version of its TradeLine software.

The new version of TradeLine, which is used to guarantee and ease payment of international trade transactions, will let portions of the application's data base reside on IBM mainframes under CICS, while other portions reside on a LAN under OS/2 Database Manager.

That is precisely the environment IBM is espousing with Networking Services/2.

Richard McGee, manager of communication systems architecture in IBM's Communication Systems division, said that within two years, mainframes will be able to be configured as end nodes in an APPN net. He would not commit to making mainframes network nodes.

"In a lot of situations, you may not want to use the mainframe for routing information — you may want to use it as a very good applications processor and a center for data bases," McGee said. "So as an end node, the mainframe could be a very good dynamic server for the enterprise network."

In that scenario, any APPC applications on the mainframe could be dynamically located by other APPN nodes in the network without having been predefined in NCP and VTAM. Likewise, mainframe-based APPC applications could locate other APPC applications dynamically. Traditional 3270 applications and devices would still have to be defined in the usual system generation fashion. ◪

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- **Marketing and sales executives** needing new, more cost-effective, customer-involving tools — for instance, 800 and 900 "gateways" to special sales agents at your company.

WHAT WILL YOU SEE AND HEAR AT TELECOM DEVELOPERS '91?

- **Computer companies** like DEC, IBM and Hewlett-Packard, who have made a major commitment to what one (DEC) calls "Computer Integrated Telephony."
- **Telecommunications switch makers** who have a "platform" they want others (end-users and developers) to write software for. Makers like AT&T, Comdial, Cortelco, Harris, Henriksen, InteCom, Northern Telecom, Redcom, Rockwell, Rolm, Siemens, Solid State, Summa Four and Teleos.
- **Manufacturers who make the building blocks** they want others to use. Hardware companies like Colonial Data, Dialogic, Rochelle and Perception Technology.
- **Software companies** like Aristacom, Cascade, Expert Systems, GBI, Nabnasset, NPRI, Telephone Response Technologies and US Telecom.

MAY 13, 1991
TELECOM DEVELOPERS '91 SEMINARS

AM SEMINARS

8:30 AM to 9:00 AM

***WELCOMING TALK* OUR NEW INDUSTRY: The NEW Opportunities for Users and Developers** *Harry Newton, publisher TELECONNECT and INBOUND/OUTBOUND Magazines*

9:00 AM to 10:00 AM

PBX-TO-HOST COMPUTER LINKS — BENEFITS AND TECHNOLOGIES, Part 1

Greg Borton, president NABNASSET Corporation

10 AM to 11 AM

PBX-TO-HOST COMPUTER LINKS — BENEFITS AND TECHNOLOGIES, Part 2

Tim Schideler, VP Strategic Accounts, Aristacom Corporation

11 AM to 12 Noon

TAKE ADVANTAGE OF USER-COMMANDED INTELLIGENT NETWORKING — NOW

Bob Pokress, president Unifi Communications

PM SEMINARS

12: Noon to 1:30 PM

***LUNCHEON TALK:* OPEN ARCHITECTURE, TODAY AND TOMORROW** *John Losier, VP and General Manager, Northern Telecom Meridian Key Division*

1:30 PM to 3 PM

VOICE PROCESSING — A TUTORIAL FOR USERS AND POTENTIAL DEVELOPERS

Bill Spain and Ed Margulies, marketing managers, Dialogic

3 PM to 4:30 PM

MODERN, OPEN ARCHITECTURE ACDs — APPLICATIONS AND BENEFITS

Al Clay, Dir.of Marketing, Rockwell
Emil Wang, VP Marketing, Aspect
Michael Maloney, Senior VP Product Dev., Teknekron

4:30 PM to 5:30 PM

"CONFESSIONS OF A TELECOM VAR"

Bill Schwartz, president XTEND Communications

8:30 AM — 9:00 AM

OUR NEW INDUSTRY: The New Opportunities For Users and Developers

Harry Newton, Publisher TELECONNECT and INBOUND/OUTBOUND Magazines

Customers must be our obsession. New telecom and computing technologies — hardware and software — allow us to treat our customers royally. These technologies also present VARs — telecom and DP — with new profitable opportunities for creating value-added telecom/computing applications solutions. Here's an overview of the exploding business of newly programmable telecom "things," from switches to voice processors, and all the building blocks you'll need.

9:00 AM — 10:00 AM

PBX-TO-HOST COMPUTER LINKS — BENEFITS AND TECHNOLOGIES, Part 1

Greg Borton, president NABNASSET Corporation

Joining the new, open telephone PBX to the corporate computer and its customer database has four major benefits: 1. It improves the quality of customer service. 2. It produces major productivity improvements for customer service representatives 3. It allows more time for selling — thus more sales. 4. It provides better management information — useful for "micro-managing." Nabnasset makes PBX/ACD-to-host software.

10:00 AM — 11:00 AM

PBX-TO-HOST COMPUTER LINKS — BENEFITS AND TECHNOLOGIES, Part 2

Tim Schideler, VP Strategic Accounts, Aristacom Corporation

Joining the new, open telephone PBX to the corporate computer has major agent productivity benefits: Basic incoming call management 15%-20%; voice and data transferring 5%-10%; voice and data conferencing 5%-10%; auto callback 10%-20%; predictive dialing 20%-50%; priority processing 5%-25%. Aristacom makes PBX/ACD-to-host software.

11:00 — 12:00 noon

TAKE ADVANTAGE OF USER-COMMANDED INTELLIGENT NETWORKING — NOW

Bob Pokress, president Unifi Communications Corporation

The goal is to liberate ourselves from the proprietary one-dimensional, hardware-based customer premise telecom equipment we have for too long been burdened with. The product is a platform for general purpose, open architecture computers — from PCs hooked to LANs and from PCs hooked to mainframes — that can orchestrate the public telecommunications network to be our own private domain. The goal is infinite flexibility, great competitive advantage, geographic independence and absence from the tyranny of technological obsolescence. Unifi is a well-funded start-up with a radical idea of what Telecom 1991 and beyond will be. This talk will eradicate all your cherished notions.

LUNCHEON TALK 12 NOON to 1:30 PM

OPEN ARCHITECTURE, TODAY AND TOMORROW

John Losier, VP and General Manager, Northern Telecom Meridian Key Division

Northern Telecom's Norstar telephone system is its first to be designed from the ground up to be "open." It is designed to actively encourage outside software developers. Norstar has announced and is selling an Applications Developers Toolkit. Mr. Losier explains where open architecture is going. And what he's learned from the last three hectic years.

1:30 PM — 3:00 PM

VOICE PROCESSING — A TUTORIAL FOR USERS AND POTENTIAL DEVELOPERS

Bill Spain and Ed Margulies, marketing managers Dialogic Corporation

Voice processing applications. The building blocks needed to create a voice processing system: hardware, software and applications generators. The different technology of voice processing — including store and forward, voice recognition, telephony interfaces, switching needs and computer connectivity. Application design — single versus multi-tasking, operating environments (DOS vs OS/2 vs UNIX), programming options, the benefits of application generators. Major voice processing mistakes made by users and vendors.

3:00 PM — 4:30 PM

MODERN, OPEN ARCHITECTURE ACDs — APPLICATIONS AND BENEFITS

Al Clay, Director of Marketing, Rockwell
Emil Wang, VP Marketing, Aspect
Michael Maloney, Senior VP Product Development, Teknekron

The automatic call distributor is today's primary inbound telephone tool. Every airline, car rental, help desk, etc. has one. Today's ACDs are opening their front ends to voice processing and their middles to new software skills and their back ends to interfacing with external computers and their databases. The benefits for improved customer service, increased sales and heightened agent productivity are enormous. These two ACD makers will point to actual in-place working ACDs.

4:30 PM — 5:30 PM

"CONFESSIONS OF A TELECOM VAR"

Bill Schwartz, president XTEND Communications, New York NY

A telecom VAR's life is not easy. You have to deal with manufacturers who think they have a lock on creativity, intelligence and honesty. Fortunately, there are a few ways of profiting over otherwise insurmountable obstacles. Here's how. Mr. Schwartz has been serving users with unique telecom solutions since 1967. His company was one of the first to use 800 ANI for call routing (a major CATV application) and it currently makes several products use the open architecture interface, including Notis, Attendant Plus, Safety Net 7, Passport Access Control and Faxithome.

DAY 2 May 14, 1991 Track one

8:30 AM
to
9:30 AM

AT&T PBX/HOST INTERFACES WHAT'S NOW. WHAT'S NEXT. WHAT'S NEEDED?

Barry Weinbaum, product manager for AT&T's DEFINITY PBX/Host product line

9:30 AM
to
10:30 AM

ROLM PBX/HOST INTERFACES WHAT'S HERE. WHAT'S NEXT. WHAT BENEFITS?

James R. Mackey Director Call Center Applications, Rolm

2 PM
to
3:30 PM

OPEN ARCHITECTURES ON SMALLER PHONE SYSTEMS (under 150 ports)

Stephen Ayers, VP Sales, Comdial Curt Kinsman, Product Manager, Norstar, Northern Telecom Bill Montgomery, VP Engineering, Cortelco

3:30 PM
to
4:30 PM

HARRIS PBX/HOST INTERFACES WHAT'S HERE. WHAT'S NEXT? WHAT BENEFITS?

Allen Jackson, VP Business development, Harris, Corp., Digital Telephone Systems Div.

4:30 PM
to
5 PM

SIEMENS PBX/HOST — US AND OVER SEAS WHAT'S HERE. WHAT'S NEXT. WHAT BENEFITS?

Johanna Cummings, PaCT Director, Siemens PNCO

5 PM
to
5:30 PM

OPEN ROUNDTABLE ON A.C.T.A.S. ASSOCIATION OF COMPUTER-BASED TELEPHONY APPLICATION SUPPLIERS

Ron Charnock, President, NPRI

8:30 AM — 9:30 AM

The AT&T PBX/HOST INTERFACES WHAT'S NOW. WHAT'S NEXT. WHAT'S NEEDED?

Barry Weinbaum, product manager for AT&T's DEFINITY PBX/Host product line.

This session will cover the motivations for voice/data integration and PBX/host connectivity via an overview of AT&T's DEFINITY PBX/Host product line which include:

- ASAI — AT&T's Adjunct Switch Application Interface
- IG — AT&T's ISDN Gateway (one direction from the switch to the host)
- AG — AT&T's ASAI Gateway (two directional)

This session will also cover AT&T's ASAI vendor partnership program and potential applications of PBX/host interfaces. Weinbaum will cover various PBX/host decision points, as AT&T plans for meeting marketplace needs for applications development and start-up in this truly multi-vendor environment.

9:30 AM — 10:30 AM

THE ROLM PBX/HOST INTERFACES WHAT'S HERE. WHAT'S NEXT. WHAT BENEFITS?

James R. Mackey Director Call Center Applications, Rolm

Rolm has targeted value-added telecommunications business solutions through PBX/host links with its outside business partners as its major thrust for t '90s. Rolm has:

- CallPath 9750 — ROLM's CICS-based integrated voice and data applications platform
- CallBridge — Rolm's IBM host or non-IBM host bi-directional computer link

In this talk, Rolm will talk about its strategy, its links, their future, the products, the business solutions, their benefits to end users and the Complementary Application Program (CAP) and its Application Specialist Program (ASP) business partners.

2:00 PM — 3:30 PM

OPEN ARCHITECTURES ON SMALLER PHONE SYSTEMS (under 150 ports)

Stephen Ayers, VP Sales, Comdial Curt Kinsman, Product Manager, Norstar, Northern Telecom Bill Montgomery, VP Engineering, Cortelco

These three telephone equipment manufacturers want you to buy their phone systems because they're good phone systems and because you can program them with your computer. They see you programming vertical and horizontal applications — from automatic call distributors to sophisticated accounting systems, from systems for investment banking to systems for florists. The idea is to let your imagination wander. These manufacturers will provide you the tools — software, hardware and toolkits — to encourage the broadest of use.

3:30 PM — 4:30 PM

THE HARRIS PBX/HOST INTERFACES WHAT'S HERE. WHAT'S NEXT? WHAT BENEFITS?

Allen Jackson, VP Business development, Harris, Corp., Digital Telephone Systems Div.

The Digital Telephone Systems division of Harris Corp. has announced VoiceFrame Digital Enhanced Services Platform — an open, non-proprietary, two-way Host Interface Link (HIL). Mr. Jackson will discuss the link and the organization Harris has put into place to support software developers and end-users wishing to capitalize on VoiceFrame's advanced abilities.

4:30 PM — 5:00 PM

THE SIEMENS PBX/HOST — US AND OVERSEAS WHAT'S HERE. WHAT'S NEXT. WHAT BENEFITS?

Johanna Cummings, PaCT Director, Siemens PNCO

Everything you wanted to know about hooking up to Siemens PBXs and working with Siemens as a Siemens PBX and Computer Teaming (PaCT) partner. Siemens is the world's largest PBX vendor outside the US and has huge distribution channels. It is committed to an open architecture and partnerships with applications vendors. In the US, Siemens owns Rolm Systems, which has announced CallBridge. In Europe, Siemens supports CallBridge to DEC CIT (Computer Integrated Telephony)

5:00 PM — 5:30 PM

OPEN ROUNDTABLE MEETING TO DISCUSS A.C.T.A.S. THE ASSOCIATION OF COMPUTER-BASED TELEPHONY APPLICATION SUPPLIERS

Ron Charnock, President, NPRI

Some manufacturers are seeking to organize a trade association to educate, to develop business ethics and codes, share market statistics, do proactive media relations and develop legislative efforts. All suppliers are invited to this open meeting to discuss the formation of A.C.T.A.S.

DAY 2 May 14, 1991 Track two

8:30 AM to 9:30 AM

CALLER ID APPLICATIONS AND OPPORTUNITIES

Gilbert Amine, President and C. Edward Olsen, VP Strategic Planning, Rochelle Communications Tom Bristovish, Senior VP Marketing, Colonial Data Technologies

9:30 AM to 10:30 AM

SPEECH RECOGNITION IN TELEPHONE/ COMPUTER APPLICATIONS

Bart Verhaeghe, Manager USA, Dr. Georges Zanelatto, VP Development, Lernout & Hauspie Speechproducts Pete Foster, president and Dr. Thomas Schalk, VP Technology of Voice Control Systems, Dallas

2 PM to 3:30 PM

THE "TIME-TO-MARKET" SHOOT-OUT: VOICE PROCESSOR APPLICATIONS GENERATORS COMPETE

Carlton Carden, President, Expert Systems Inc. Chris Bajorek, President, Telephone Response Technologies Vigdis Austad, President, Cascade Technologies Inc.

3:30 PM to 4:15 PM

VOICE PROCESSING APPLICATION DEVELOPMENT PLATFORMS

J.J. Kelly, President, U.S. Telecom

4:15 PM to 5 PM

BEYOND VOICE MESSAGING, CALL PROCESSING & INTERACTIVE VOICE RESPONSE

Vincent Deschamps, Director of Sales, VMXworks, VMX, Inc.

SEMINAR ATTENDEES ARE ADMITTED FREE TO THE EXHIBIT FLOOR FOR HANDS-ON DEMONSTRATIONS

8:30 AM — 9:30 AM

CALLER ID APPLICATIONS AND OPPORTUNITIES

Gilbert Amine, President and C. Edward Olsen, VP Strategic Planning, Rochelle Communications Tom Bristovish, Senior VP Marketing, Colonial Data Technologies

By end 1991, over 25 million telephones in the US and Canada will receive local caller ID on their phone. They'll know the phone number of the person calling them. Rochelle and Colonial Data have developed single and multi-line devices, computer and telephony tools and toolkits (hardware and software) to help you capture the caller ID. These devices provide a practical means for developers, VARs and end-users to add caller ID into their applications — customer database lookups (e.g. pizza preferences), emergency (doctors offices), security, etc. What are the opportunities? The benefits? And the future?

9:30 AM — 10:30 AM

SPEAKER INDEPENDENT SPEECH RECOGNITION IN TELEPHONE AND COMPUTER APPLICATIONS

Bart Verhaeghe, Manager USA, Dr. Georges Zanelatto, VP Development, Lernout & Hauspie Speechproducts Pete Foster, president and Dr. Thomas Schalk, VP Technology of Voice Control Systems, Dallas

Voice recognition is now much broader than 1-9 and "Yes" and "No" to address rotary telephones. It's words and other languages. You can now do things with the voice you can't do easily with the touchtone pad — e.g. speaking letters and numbers (as against hunting and pecking around the touchtone pad.) There's also verification for security and for superior customer service. New industries are emerging, such as in banking for voice-verified credit cards, for telemarketing, for retailing, for dealer locator, for interactive TV games.

ALL TELECOM DEVELOPERS '91 ATTENDEES ARE PROVIDED WITH PERSONAL VOICE MESSAGING SERVICE DURING THE CONFERENCE COURTESY VMX

2:00 PM — 3:30 PM

THE "TIME-TO-MARKET" SHOOT-OUT: VOICE PROCESSOR APPLICATIONS GENERATORS COMPETE

Carlton Carden, President, Expert Systems Inc. Chris Bajorek, President, Telephone Response Technologies Vigdis Austad, President, Cascade Technologies Inc.

Go buy some Dialogic boards. Buy a DOS, OS/2 or Unix PC. Buy an Applications Generator from one of these companies and create your interactive voice response/ processing system. Applications generators are designed to save you the tedium of programming from scratch. And if they do help, which one helps you get up and running fastest? Which one is best? How do you choose?

3:30 PM — 4:15 PM

VOICE PROCESSING APPLICATION DEVELOPMENT PLATFORMS

J.J. Kelly, President, U.S. Telecom

What level do I start to build my chosen voice processing application/s? In this session we examine the benefits of hard code versus AP and development environment versus applications generators.

The emphasis is on getting the final application job/s done as efficiently, as creatively and painlessly as possible. Whether you're a novice or a professional voice processing programmer, you should attend this practical tutorial from one of the industry's leading platform suppliers.

4:15 PM — 5:00 PM

BEYOND VOICE MESSAGING, CALL PROCESSING & INTERACTIVE VOICE RESPONSE

Vincent Deschamps, Director of Sales, VMXworks, VMX, Inc.

Many companies have installed voice processing, voice mail and automated attendant. But you ask, "Why can't they work together and share information so they can support even more powerful applications? What can't I customize the applications to meet my applications needs, not those conceived by the vendor?" This session reviews emerging integrated applications and industry directions for further integration and customization.

DAY 3 May 15, 1991 Track one

8:30 AM to 10 AM **NORTHERN'S PBX PLATFORMS, BENEFITS & SUPPORT — AN OVERVIEW**

Christine Herzog, VAR Manager, Meridian Link, Northern /Dick D'Soto, Product Manager, Meridian TeleCenter, Northern/Mike Glenn, Manager, CNO

10 AM to 11 AM **DEC'S COMPUTER INTEGRATED TELEPHONY**

Carl Strathmeyer, CIT Product Marketing Manager, DEC

2 PM to 3:30 PM **"DUMB" SWITCHES — THE ULTIMATE OPEN SWITCH**

Michel Berger, Director of Marketing, Teleos Bud Henriksen, President, Henriksen Data Systems Phyllis Hoffman, VP Marketing, Summa Four Joe Murgio, VP Marketing, Telco Solutions Larry Vuksanic, Dir of Sales Engineering, Redcom

3:30 PM to 4:30 PM **THE INTECOM OPEN APPLICATION INTERFACE**

Jim Honeycut, Manager of OAI Systems Engineering, InteCom

4:30 PM to 5:15 PM **IBM'S VOICE ENHANCED SOLUTIONS STRATEGY**

Linda Sanford, Director of Voice Enabling Systems, IBM

5:15 PM to 6 PM **PREDICTIVE DIALING ADVANCES**

Michael Darland, President, Digital Systems InternationalGreg Kagan Dir of Marketing, TeleDirect

8:30 AM — 10:00 AM

NORTHERN TELECOM'S PBX PLATFORMS, BENEFITS & SUPPORT — AN OVERVIEW

Christine Herzog, VAR Manager, Meridian Link, Northern Dick D'Soto, Product Manager, Meridian TeleCenter, Northern Mike Glenn, Manager, Corporate Networks Operations

Northern Meridian Link is Northern Telecom's main PBX-to-computer host link. Here's a description of how it works, what its benefits are, an overview of Northern's Strategic Alliance Program and Northern's VAR program. Meridian TeleCenter is a Macintosh software platform communicating with the Meridian 1 PBX. Corporate Networks Operations is a strategic alliance partnership of Northern and Hewlett-Packard. CNO has signed up about a dozen HP VARs and is actively seeking more.

10:00 AM — 11:00 AM

DEC'S COMPUTER INTEGRATED TELEPHONY

Carl Strathmeyer, CIT Product Marketing Manager, DEC

Digital Equipment Corporation now has PBX-to-computer interfaces to every major telephone in the country. They call their link CIT, which stands for Computer Integrated Telephony. DEC has over 20 VARs with over 30 applications. They range from security locator systems to help desks, from debt collection to telemarketing. The speaker has spoken, written and been immersed in PBX-to-computer host links probably longer than anyone else.

2:00 PM — 3:30 PM

"DUMB" SWITCHES — THE ULTIMATE OPEN SWITCH

Michel Berger, Director of Marketing, Teleos Bud Henriksen, President, Henriksen Data Systems Phyllis Hoffman, VP Marketing, Summa Four Joe Murgio, VP Marketing, Telco Solutions Larry Vuksanic, Dir of Sales Engineering, Redcom Laboratories

"Dumb" switches derive all their intelligence from an external computer. Without that computer they would sit dead in the water. Dumb switches have major pluses: They're more "configurable." You can create more specialized applications. "Dumb" switches are being used today for out-in-the field emergencies, marine phones, switching of voice messages, and for service bureaus. They're also less expensive to buy and much cheaper to run. Each of these four companies makes a switch for which demand has been exploding, Redcom has the MSP — Modular Switching Peripheral. Teleos has the IRX-9000. Henriksen has the PBXtra. And Summa Four has the UnaSwitch. Here are four manufacturers and one software developer (Telco Solutions).

3:30 PM — 4:30 PM

THE INTECOM OPEN APPLICATION INTERFACE

Jim Honeycut, Manager of OAI Systems Engineering, InteCom

InteCom writes, "All telephone systems provide switching from A to B. InteCom's IBX and TELARI systems go beyond basic communications to simultaneous voice and data, local area networking, ACD, and more importantly, integrated applications via the Open Application Interface (OAI). OAI is both a concept and a physical interface." With an external computer, you can control call movement, messaging and the PBX's databases, etc. More than 70 sites are using InteCom's OAI. InteCom has over 20 developers and is seeking additional ones.

4:30 PM — 5:15 PM

IBM'S VOICE ENHANCED SOLUTIONS STRATEGY

Linda Sanford, Director of Voice Enabling Systems, IBM

Few companies have combined their phone and computer systems to enable a new breed of customer-pleasing business applications. IBM is targeting the joining as a major thrust of its own marketing strategy in the 1990s. Its strategy is to deliver "enablers." These "enablers" includes CallPath Services Architecture and the CallPath product family. IBM has "enabling" relationships with AT&T, Ericsson, Northern Telecom, Rolm and Siemens. Benefits from joining phones and computers include improved customer service, increased agent productivity and higher revenues. All this adds to a significant competitive advantage. Here's an overview.

5:15 PM to 6:00 PM

PREDICTIVE DIALING ADVANCES

Michael Darland, President, Digital Systems International Greg Kagan. Director of Marketing, TeleDirect

In manual outbound calling, operators spend time before each call reviewing paper records or computer screens, selecting the person to be called, finding the phone number, dialing the number, listening to the rings, listening to phone company intercepts, listening to busy signals. Predictive dialing does it automatically. The result is productivity increases of 300% to 600%. Payback on predictive dialing systems is very high.

DAY 3 May 15, 1991 Track two

8:30 AM
to
9:15 AM

COMPUTER-TO-PBX LINK SOFTWARE APPLICATIONS

Ron Charnock, President, NPRI

9:15 AM
to
10 AM

ISDN: USER OPPORTUNITIES? ENTREPRENEURIAL OPPORTUNITIES?

Ken Pedersen, VP Marketing, Progressive Computing

10 AM
to
11 AM

GREAT VOICE PROCESSING APPLICATIONS

Ron Scott, Manager of Telecom Planning, Science Applications International Bill Schwartz, President, XTEND Joe Sigler, VP Marketing, Access Logic Technology Larry Bradner, CEO, TeleCorp Systems

2 PM
to
3:30 PM

ENHANCED FAX PROCESSING — PRODUCTS AND SERVICES

David Rae, President, SpectraFax Gene Rosow, President, FAX900 Mike DeMas, VP Marketing, Audiofax

3:30 PM
to
4:30 PM

PLEASING CUSTOMER CALL CENTER SOFTWARES AND HARDWARES

Bruce A. Calhoon, President, Call Center Technologies Ben Compaine, President, Nova Systems, Inc. Jim Quiggins, National Sales Manager, TCS Management Group Diane Kamionka, President, Cintech Tele-Management System

4:30 PM
to
5:15 PM

TODAY'S MOST WACKY (OR MOST INTRIGUING?) NEW OPEN SWITCHES

Dr. Robert McNamara, President, First Pacific Networks Joe Barnas, VP Sales and Marketing, TriLAN Systems

8:30 AM — 9:15 AM

COMPUTER-TO-PBX LINK SOFTWARE APPLICATIONS

Ron Charnock, President, NPRI

NPRI makes PBX-to-host applications software. Their applications cover inbound call routing and outbound predictive dialing — telemarketing, sales, lead generation and qualification, surveys and market research, collections, fund raising, direct response follow-up, field sales appointment scheduling, recruitment programs. NPRI has over 17,000 computer terminals in America's largest companies using their software. Here's a capsule of their experiences.

9:15 AM — 10:00 AM

ISDN: USER OPPORTUNITIES? ENTREPRENEURIAL OPPORTUNITIES?

Ken Pedersen, VP Marketing, Progressive Computing

Today, ISDN is tariffed in many places. There are real users, deriving real benefits, especially Automatic Number Identification (ANI). ISDN is being installed, is being used and there are opportunities, especially using programmable PC terminal adapters. Here's a quick synopsis of ISDN today and some hints on designing, testing and debugging your own ISDN applications.

10:00 AM — 11:00 AM

GREAT VOICE PROCESSING APPLICATIONS — CATV Pay TV, THE WORLD'S BEST HELP DESK & OTHERS

Ron Scott, Manager of Telecom Planning, Science Applications International Bill Schwartz, President, XTEND Joe Sigler, VP Marketing, Access Logic Technology Larry Bradner, CEO, TeleCorp Systems

TeleCorp's voice processing equipment answers the phones for over 10 million CATV subscribers for customer service, dispatch, repair and pay TV. That's one industry being revolutionized by voice processing.

2:00 PM — 3:30 PM

ENHANCED FAX PROCESSING — PRODUCTS AND SERVICES

David Rae, President, SpectraFax Gene Rosow, President, FAX900 Mike DeMas, VP Marketing, Audiofax

Fax-back (also called Fax on Demand) is booming. Companies providing fax-back services save operators, save money, give better service, win greater customer goodwill. Fax-back also works with 800- and 900-service. And if you digitize your faxs (it's easy), your outgoing faxs can be super quality. Now there's also fax-mail — voice mail for faxs. Here's a total overview of this exciting new customer pleaser. Two equipment makers and one service bureau. Try some demos. Call 813-643-7600, 208-344-4809, 404-618-4555 or 900-446-4020.

3:30 PM — 4:30 PM

PLEASING CUSTOMER CALL CENTER SOFTWARES AND HARDWARES

Bruce A. Calhoon, President, Call Center Technologies Ben Compaine, President, Nova Systems, Inc. Jim Quiggins, National Sales Manager, TCS Management Group Diane Kamionka, President, Cintech Tele-Management System

You can now buy software and hardware to make your phone system an ACD. Cintech makes it for the Norstar. You can now buy software which will display real-time call center information. Nova makes it. You can now buy software to plan which people (also called agents) to employ when and how many of them. TCS makes manpower planning software. Here's an overview of what's happening in incoming call centers — large and small. Bruce Calhoon is involved in central office ACDs.

4:30 PM — 5:15 PM

TODAY'S MOST WACKY (OR MOST INTRIGUING?) NEW OPEN SWITCHES

Dr. Robert McNamara, President, First Pacific Networks Joe Barnas, VP Sales and Marketing, TriLAN Systems

A First Pacific brochure says "We believe that deploying communication networks should be no more difficult than plugging your telephone, computer or video workstation into the same wall outlet." The company makes the world's first "media independent" telecom switch.called the Personal Xchange. It will frow from 10 to 10,000 users. The company has raised over $30 million. Here's an overview. TriLAN says everything about First Pacific applies to it also, except that it's a subsidiary of Dukane, the system is called TriLAN and will only grow to 2,000 workstations.

EXHIBITORS
AS OF EARLY MARCH, 1991

- ***Aspect Telecommunications***
- ***AT&S Inc.***
- ***Business Computer Consultants***
- ***DBA Communications***
- ***Cascade Technologies***
- ***Comdial Corporation***
- ***DGM & S***
- ***Dialogic***
- ***Digital Equipment Corporation***
- ***Expert Systems***
- ***Harris Corporation***
- ***Henriksen Data Systems***
- ***INBOUND/OUTBOUND Magazine***
- ***Inova Corporation***
- ***InteCom Inc.***
- ***Lernout & Hauspie Speech Products***
- ***LIR***
- ***Mitel***
- ***Nabnasset Corporation***
- ***Newbridge Networks***
- ***Northern Telecom/Norstar***
- ***NPRI***
- ***Open + Voice***
- ***Perception Technology***
- ***Redcom Labs***
- ***Remote Control International (TeleMagic)***
- ***RLG Telecom & Associates***
- ***Rochelle Communications***
- ***Rockwell Corporation***
- ***Sidon Data Systems***
- ***Software Marketing Assoc.***
- ***Solid State Systems***
- ***Source Data Systems***
- ***Stryker Systems Inc.***
- ***Summa Four***
- ***Voice Systems Research***
- ***TCS Management Group***
- ***Teknekron Infoswitch***
- ***TELECONNECT Magazine***
- ***Telenetworks***
- ***Teleos Communications***
- ***Telephone Response Technologies***
- ***Unifi Communications Corporation***
- ***Univoice***
- ***US Telecom***
- ***Voice Control Systems***
- ***VMX***
- ***XTEND Corporation***

TELECOM DEVELOPERS '91 SPEAKERS INDUSTRY LEADERS

These men and women are pioneers in our new age. You can learn from them and others at TELECOM DEVELOPERS '91

Michel Berger, Teleos

Larry Bradner, Telecorp

Bruce Calhoon, Call Center Technologies

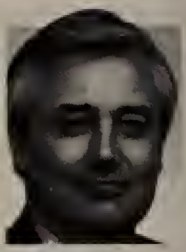
Carlton Carden, Expert Systems

Ron Charnock, NPRI

Al Clay, Rockwell

Ben Compaine, Nova Systems

Johanna Cummings, Siemens


Mike Glenn, Northern Telecom

Bud Henriksen, Henriksen Systems

Alan Jackson, Harris Digital Telephone

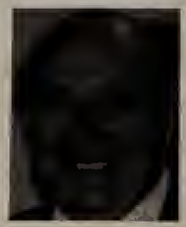
John Losier, Northern Telecom

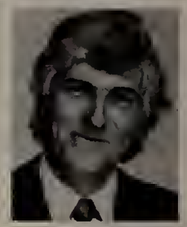
Jim Mackey, Rolm

Ed Margulies, Dialogic

Robert McNamara, First Pacific Networks

Bill Montgomery, Cortelco


Joseph Murgio, Telco Solutions

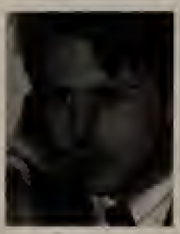

Harry Newton, TELECONNECT INBOUND/OUTBOUND

Ken Pedersen, Progressive Computing

Bill Schwartz, XTEND

Tim Shideler, Aristacom

Bill Spain, Dialogic


Bart Vernaeghe, Lernout & Hauspie

Laura Watkins, VMX

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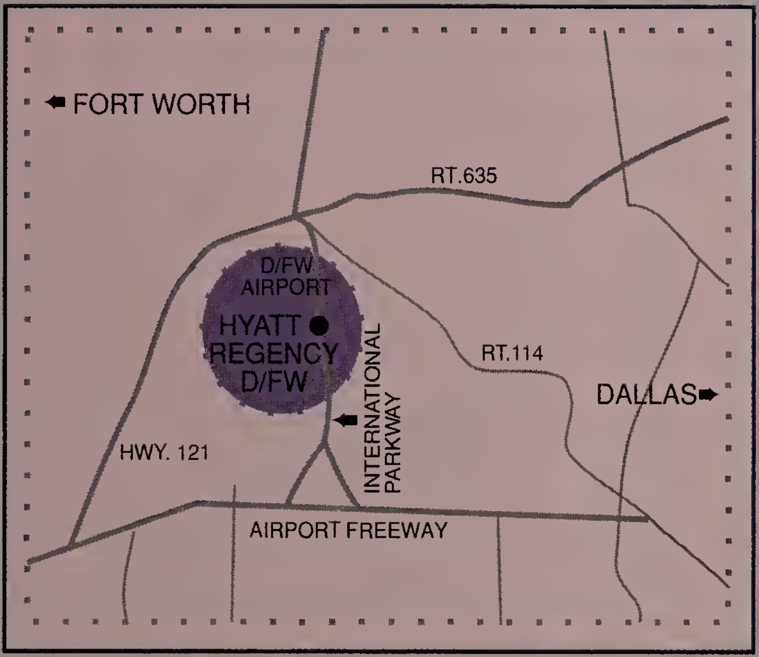

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"I don't think there's an up side to internetworking from a security perspective. The more people you need to accommodate, the more transmissions you have to support and the worse things get."

Michael Hurwicz
President
MTI Group
Eastsound, Wash.

Netnotes

As expected, the **U.S. Air Force Computer Acquisition Center (AFCAC)** recently awarded Digital Equipment Corp. a local-area network contract valued at $54 million.

The contract calls for DEC to provide, among other things, LAN hardware, software, installation and maintenance for Department of Defense agencies and the Federal Bureau of Investigation.

The **AG Group** recently brought out the NetPatrol Pack, a bundle of network management products for monitoring, troubleshooting and optimizing Apple Computer, Inc. AppleTalk and multivendor local-area networks.

The NetPatrol Pack includes three products: EtherPeek, an Ethernet network analyzer; LocalPeek, a LocalTalk net analyzer; and Net Watchman, an AppleTalk network monitor. Net Watchman is an existing product that was previously called NetAlert.

Net Watchman automatically creates a list of all registered zones, bridges, nodes and servers on the internetwork and monitors for changes or irregularities.

If the disruption cannot be fixed easily, EtherPeek and LocalPeek offer packet-level analysis for troubleshooting. Both products work by capturing packets on the network for real-time analysis. The NetPatrol Pack is available now for $1,195. ◼

Wiring hub ties Ethernet, token ring over FDDI net

Luxcom product also links with IBM terminals.

HAYWARD, Calif. — Luxcom, Inc. last week announced an intelligent wiring hub that enables users to connect Ethernet- and token-ring-attached workstations, as well as IBM terminals, over an FDDI backbone.

Luxcom's LC100 Series 2000 Universal Smart Hub will enable users to piggyback IBM 3270-type terminal traffic over a 100M bit/sec backbone that also supports Ethernet and token-ring local-area network data.

"LANs are fast becoming a staple of life in the office environment," said Luxcom President Staffan Fredricsson. "But many of our customers still have 3270 terminal nets. They need an infrastructure to support both types of traffic on the same backbone."

Designed to fit into a wiring closet, the LC100 Series 2000 is a wall-mounted device with a central control module and slots for as many as eight access modules that support connections to cluster controllers, as well as Ethernet, token-ring and wide-area networks.

Access modules are linked via a universal bus as opposed to separate buses for Ethernet, token-ring and Fiber Distributed Data Interface data.

A single 100M bit/sec fiber backbone that supports the FDDI physical-layer protocols links LC100 Series 2000 units on different floors in a building.

The LC100 Series 2000's control module, which supports time-division multiplexing, divvies up the backbone's bandwidth by interspersing terminal, LAN and WAN traffic on different segments of the backbone's bandwidth.

"The beauty of this type of a device is that, from a single platform, it lets you provide a variety of options, as opposed to maintaining physically separate networks," said Rainier Tuinzing, director of marketing at Luxcom.

The control module also provides a transmit and receive port on the FDDI backbone.

LC100 Series 2000 access modules are available to link Ethernet workstations to the hub via 10BaseT connections. Token-ring modules support 4M and 16M bit/sec connections over shielded and unshielded twisted pair. Access modules are also available for RS-232/422, IBM 3270, 5250 and 5080 terminals, as well as T-1 and T-3 links.

The company said it will offer a $2,495, 12-port 10BaseT module that enables users to support as many as 96 10BaseT Ethernet connections per hub.

A four-port 10Base2 access module costs $1,495, and a 10Base5 module with a single attachment unit interface and transceiver costs $995. A 16-port token-ring module enabling users to support a maximum of 128 token-ring nodes is priced at $1,995, while a four-port repeater costs $1,495.

(continued on page 23)

Networking wares debut at Windows, OS/2 show

By Eric Smalley
Senior Editor

SAN JOSE, Calif. — Several networking products for Microsoft Corp. Windows 3.0 and OS/2 were introduced at the Windows and OS/2 Conference here earlier this month.

Among the offerings were two asynchronous communications packages for OS/2 — one from Software Corporation of America (SCA) of Stamford, Conn., and the other from OSI Software of Dayton, Ohio.

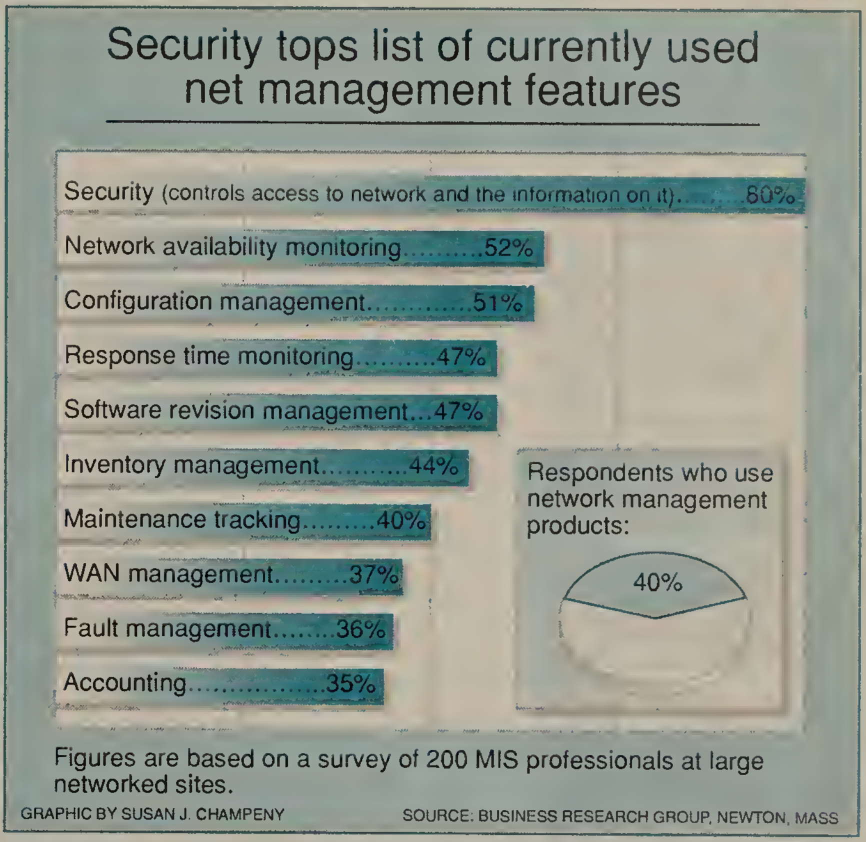
SCA's TalkThru, which provides for terminal emulation, enables an OS/2 computer to connect to IBM, Digital Equipment Corp. and Hewlett-Packard Co. host computers using asynchronous communications protocols.

TalkThru is an OS/2 Presentation Manager-based application. It supports IBM's Extended High Level Language Application Program Interface (EHLLAPI), easing the programming task of incorporating asynchronous communications into applications, according to SCA officials.

TalkThru communicates directly through the OS/2 communications port, IBM's Communications Manager or over Transmission Control Protocol/Internet Protocol. It costs $350.

OSI Software unveiled its Split-Line OS/2 Presentation Manager-based application that runs over OS/2's communica-

(continued on page 23)


Security tops list of currently used net management features

Figures are based on a survey of 200 MIS professionals at large networked sites.
GRAPHIC BY SUSAN J. CHAMPENY
SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS

Security lapses pose risk to LAN internets

As more nodes and LANs are interconnected, users are unable to provide adequate safeguards.

By Caryn Gillooly
Senior Editor

Although network security is an old problem, users are still largely paying lip service to the issue as they interconnect existing LANs, leaving their networks open to a number of possible disasters.

To their credit, local-area network administrators are showing more interest than ever in securing their networks but still not nearly as much as they should be, security experts and analysts said.

According to a recent study by Business Research Group, Inc. (BRG), a Newton, Mass., market researcher, 32% of some 200 MIS professionals surveyed are using some form of security. BRG said 40% of all respondents are using network management. Of those users, 80% employ security features (see graphic, this page).

"We constantly need more security: The network has new nodes, the LAN carries more important information, and management counts on the network more than it did last year," said David Stang, director of research at the National Computer Security Association (NCSA) in Washington, D.C.

LAN security is still a relatively new field. "The security is mostly in the network operating system, in the file server," Stang said. "The network needs to monitor the workstations."

As information is distributed throughout the network, he said, security has to be implemented accordingly.

Harold Highland, computer security consultant at Compulit in Elmont, N.Y., took the issue a step further. "I don't think anyone's prepared to internetwork — not yet," he said. "We've never had security on LANs in the first place. Internetworking will spread the insecurity around even more."

Security threats of internetworking

- Increased number of users
- Increased access to network
- Loss of data control
- Increased exposure to public network
- Increased risk of virus infection
- Fragmented network administration

GRAPHIC BY SUSAN J. CHAMPENY

Despite the lack of security controls in their LANs, users are internetworking their nets, a feat many analysts said carries high risks if proper security measures are not in place.

Forging ahead

Internetworking, for instance, increases the number of users on the network. According to Stang, the No. 1 cause of security/data integrity disasters is "user bumbling," where users accidentally delete files or change numbers on

(continued on page 25)

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Cabletron, Cayman enter joint development and marketing pact

By Eric Smalley
Senior Editor

Cabletron Systems, Inc. and Cayman Systems, Inc. last week announced a cooperative marketing and development agreement under which the companies will integrate Cayman's LocalTalk gateway with Cabletron's intelligent hub.

The companies will also jointly develop products that both companies will market, sell and service, said Chris Oliver, director of engineering for Cabletron.

The alliance between the companies was actually signed in August, according to Oliver. The first product to result from the deal is expected to be introduced in the next two months.

That product will integrate Cayman's GatorBox with Cabletron's Multi Media Access Center (MMAC), which is an Ethernet hub, said Carol McGarry, marketing communications manager at Cayman. The GatorBox ties Apple Computer, Inc. LocalTalk networks to Ethernet networks.

Cayman also offers applications for the GatorBox that provide file and print sharing, electronic mail and AppleTalk-to-Transmission Control Protocol/Internet Protocol translation.

Those applications will also be integrated into the MMAC, and other application gateways will be developed by the companies, Oliver said.

Two-thirds of all Apple Macintoshes are located at corporate sites. That, coupled with the trend toward intelligent hubs, brought the companies together, he added.

The first product to result from the deal is expected to be introduced in the next two months.

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Net wares debut at OS/2, Windows show

continued from page 21

tions port and allows three simultaneous communications sessions to host computers. The software supports the Kermit, Xmodem and Ymodem asynchronous communications protocols at speeds up to 19.2K bit/sec.

Split-Line supports DEC VT, IBM 3101 and ANSI terminal emulations. Split-Line is priced at $295.

For the Windows environment, ASD Software, Inc. of Montclair, Calif., released a groupware scheduling package that runs on Windows personal computers and Apple Computer, Inc. Macintoshes.

ASD's PlaniSoft allows members of a work group to schedule meetings.

The software has the same interface for Windows and Macintosh, and users can share a common Planisoft file from a personal computer or Macintosh, according to company officials.

PlaniSoft supports AppleShare, Sun Microsystems, Inc.'s TOPS and Novell, Inc.'s NetWare. A five-user license costs $895, and a 10-user license costs $1,295.

Separately, Distinct Corp. of Saratoga, Calif., announced that its Windows 3.0 backup package, Distinct Backup, can now be used to back up a personal computer to a Network File System server.

Wiring hub ties Ethernet, token ring

continued from page 21

On the terminal side, access modules for IBM 3270, 5080 and 5250 terminals cost $895, $1,195 and $995, respectively. Luxcom also offers a four-port V.35 access module for $995 and a four-port RS-232/422 wide-area access module for $795. The company said a T-1 access module will ship later this year; however, pricing for that offering has not been released.

The base LC100 Series 2000 unit costs $4,995 and is available now.

Luxcom also provides an LC100 Network Manager module for the LC100 Series 2000 to manage Ethernet, token-ring, terminal and WAN connections from a central OS/2-based console. The software supports the Simple Network Management Protocol and provides a bidirectional link to IBM's NetView host-based network management system.

The LC100 Network Manager module costs $795.

For more information, contact Luxcom at 3848 Bay Center Place, Hayward, Calif. 94545, or call (415) 786-1200.

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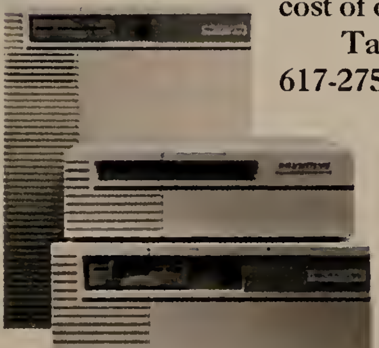

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Circle Reader Service #107

GSA executive talks of FTS 2000

continued from page 1

rough idea of how much money it saves, both overall and on a per-call basis?

On the voice side, we would estimate conservatively that the system is saving $200 million a year.

At least $150 million of that is due to the amount of traffic that was on the old FTS system, and then we've seen a very substantial growth in traffic. [Voice traffic was] something like 1.2 billion to 1.4 billion minutes a year [and has increased] to more like 1.8 billion minutes a year.

It is much more difficult to do comparisons on the data side because many of the data costs were embedded into the data systems. The data business right now is probably only about a tenth of the voice business, although it is growing rather rapidly.

Do you save money on data?

Well, we think so. It depends on the specifics of the circumstances. But in most cases, we see that the prices we pay on FTS 2000 are significantly less than the tariffed prices. In many cases, our users were paying tariff prices; in those cases, we are saving money.

And how much savings is there on a per-call basis?

Well, the old system cost about 27 cents a minute, and the new systems is around 13 to 15 cents a minute. [This is the sum that is charged to the agencies that use FTS 2000. The actual savings in contract terms is higher because the GSA's overhead is included in the 13-cent figure.]

The contract cost is probably more in the 11- to 13-cent range vs. 27 cents if you want an apples-to-apples comparison.

How much is spent on FTS 2000 on an annual basis?

Somewhere in the neighborhood of $300 million a year right now. Probably around $350 [million] by the end of the year.

Are AT&T and US Sprint Communications Co. providing detailed billing to all of the end-user agencies?

The two FTS 2000 vendors provide call detail records [and have] since the beginning. If only one agency is on that PBX, then obviously they separate it by agency. But most of our consolidated locations serve multiple agencies.

Where we have ANI, we've got a call detail record that has the calling and the called number. One of the big efforts of this year will be to move to get ANI established.

So at the moment, you do not really know which agency is doing what?

Well, not without taking the FTS 2000 information and running it against the station message detail reporting information from a PBX or a Centrex. So you don't know that directly from the FTS 2000 bill except in those locations that have ANI.

Is that what you do when you prepare a bill for the agency?

No.

How do you prepare a bill for the agencies?

The agencies basically get the bill from the FTS 2000 vendors. I might also add that, originally, neither of these bills had any prices on them. So you've got the called number and the duration, but you didn't actually get how much it costs.

As of December, both vendors started putting prices on the bills.

At this point, we've got a hybrid sort of a billing arangement. In locations [where there is only one agency], they can directly match the bill from us with the bill from the vendor. In consolidated locations, we use sampling to divide the bill among the agencies. As we get ANI, then of course we'll move to a direct [itemized bill].

FTS 2000 is not a Tariff 12; it's under Tariff 16, a tariff for special government networks. But how do you think FTS 2000 compares with some of the larger Tariff 12s?

I think pretty favorably. But they're not directly comparable. They will [increasingly] be less comparable as we complete the institution of ANI because that's not a service that you get normally [except] in the Tariff 16 capabilities. [A Tariff 12 network would] not get the level of billing detail, by any stretch, that you can get from FTS 2000 because, in general, [a Tariff 12] won't give ANI.

That's just one example. One of the other things you don't get outside of a Tariff 16 is switched digital integrated services.

In other words, you can't add your voice service and your data service and get a price reduction associated with both of them. And that can be major. I suspect that voice services, for example, might well decrease another penny a minute, based strictly on wide-scale implementation of switched digital integrated services.

Speaking about switched digital services, how close are you to ISDN?

We will have our first ISDN sites up and running, I hope, in April of this year. I fully expect that we will.

Where?

Boston, Auburn, Wash., and Kansas City, Mo.

What agency or agencies will be using ISDN?

These are GSA-consolidated switch locations. So they are our own switches, and they serve multiple agencies.

Will the ISDN service be on the FTS 2000 B network provided by US Sprint or the A network provided by AT&T?

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We, GSA, are on B. But our consolidated services are governmentwide services. So our consolidated services support both B and A customers, and in almost all cases, are on both B and A. In fact, that was one of the exciting parts of transition. We went from a trunk route on one network to two trunk routes on two networks. So we actually split the trunk routes into an A trunk route and a B trunk route.

Your experiment in April would allow GSA in Auburn to speak over a fully ISDN circuit to GSA in Boston?

Well, the answer is probably yes. There will be a Primary Rate Interface into the network and a Primary Rate Interface out of the network, so it will allow a telephone in Auburn to call a telephone in Boston.

Will the telephones be ISDN?

The telephones on both ends are probably analog telephones.

We're looking at some additional locations slightly later in the year where we would like to go to full end-to-end ISDN — basic rate from the [telephone] to a PBX and primary rate from the PBX into the network. ◪

Security lapses pose LAN risks

continued from page 21

spreadsheets or in the data base, for example. Sometimes, network disasters are caused by angry users who utilize their network privileges maliciously.

These risks increase exponentially as more users gain access to the network.

Other analysts said some LAN administrators sacrifice security just by allowing more access to the network.

"If you have one building in New York that's internetworked with one in Tokyo and one in Los Angeles, you'd have to be more suspicious" as there are three times as many points of access to potentially mission critical data, said Michael Hurwicz, president of MTI Group, a consultancy in Eastsound, Wash.

Analysts also warned that LAN security is only as good as the security on the network to which it connects. "Each network takes care of its own security. When they join hands, it's all over," Highland said.

Cheryl Currid, founder of Cheryl Currid and Co., a consulting firm in Houston, offered the example of a network where a boss's secretary had supervisory rights to all files on a LAN. However, users attaching to that LAN lower their own security safeguards because users with supervisory privileges can access nodes on their LAN.

And not only may information be jeopardized by someone else's lax security, but when data passes to an interconnected net, there is no way to determine its status.

> "Each network takes care of its own security. When they join hands, it's all over," Highland said.
>
> ▲▲▲

"How do you know if security has been violated?" Highland asked. "Once the data goes through, if you have no idea what kind of security they have, there's no way to know what state the data is in."

Into another domain

Internetworking over the public switched network brings an additional set of problems, primarily concern over wire tapping. "It's much easier to tap into a network if its relying on carrier services," said Jim Harrison, program director for global networking at the META Group in Westport, Conn. "This way, someone doesn't need access to your premises to have access to your network."

Analysts agreed, however, that this is probably the smallest threat and the easiest problem to solve by using data encryption. But that has its downside. Encryption today is usually performed at the workstation or server, which can severely hamper network performance.

Virus threat

One threat that is not so easy to solve is that of virus infection. Although the probability of a virus affecting a network is fairly low — about one in 10 — it nevertheless ranks second in severity of damage if it hits, according to NCSA's Stang.

However, analysts agreed that the possibility of an infection is a matter of numbers. As the number of nodes on the network and the number of networks connected increases, so does the likelihood that an infection will occur.

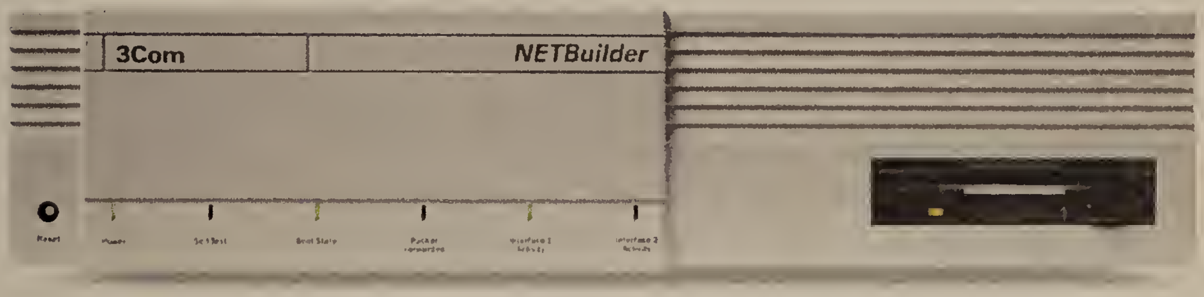
Even worse, because there are literally hundreds of viruses already written and more being created almost every day, guarding against them is almost impossible, Stang said.

Analysts agreed that the most effective protection is through adoption of strict LAN administration policies, such as screening floppy disks for viruses before allowing them to be loaded onto a user's machine and by not providing any network connections to widely interconnected networks such as the Internet.

Analyst warned of one final problem when internetworking: administration responsibilities. Many administrators today are having a difficult time deciding who is in charge of what network segment. In an internetworked LAN, that problem is compounded.

"Administration and security policies can become harder to enforce" over an internetwork, Hurwicz said. "There may no longer be one net authority." ◪

Ch Changes.



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9. Multi-department LANs currently in use at location.
10. Modems under 9600 BPS planned for purchase over the next 12 months.
11. Protocol converters planned for purchase over the next 12 months.
12. Wide-area networks currently in use at location.
13. Wide-area networks planned for purchase over the next 12 months (tied for first).
14. Bridges, routers or gateways planned for purchase over the next 12 months.
15. T-1 or T-3 networks currently in use at location.
16. Micro-mainframe emulation boards currently in use at location.

Network World Readers . . . largest companies, biggest budgets, power to spend

17. Personally involved in spending over $100K on voice communications systems in the past 12 months.
18. Can authorize expenditures in excess of $25K for computer, networking or communications equipment or software.
19. 10 or more internetworked sites in organization.
20. 1,000 or more employees in organization.
21. More than $1 billion in total company sales.
22. Management responsibility/networking or communications job function.

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MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

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>
> **Stanley Welland**
> Manager
> Corporate telecommunications
> General Electric Co.
> Stamford, Conn.

Association Watch

The **International Communications Association (ICA)** will hold its 44th Annual Conference and Exposition June 2 through 7 at the Anaheim Convention Center in Anaheim, Calif.

The ICA conference will include a demonstration designed to showcase multivendor networking. The demo will feature a backbone network based on two Fiber Distributed Data Interface local-area networks interconnected at high speeds and integrated applications running across the network.

Multiple hardware, software and systems integration vendors will participate in the demonstration. Digital Equipment Corp. will manage the FDDI network.

The cost for the entire conference and exposition is $795 for ICA members who register by May 3. Members who register after that date will pay $895.

This year, ICA is introducing a special package for non-ICA members that includes admission to the exposition, 19 technical sessions and three keynote presentations. Admission to the session and exhibits costs $395 per person, while admission only to the vendor exhibit hall costs $25.

For more information, contact ICA Expo, 12750 Merit Drive, 710 LB-89, Dallas, Texas 75251; (800) 422-4636; fax: (214) 233-2813.

(continued on page 29)

Voice response simplifies Cal. State class registration

New system saves time, money and headaches.

By Maureen Molloy
Staff Writer

LONG BEACH, Calif. — Students at California State University at Long Beach (CSULB) no longer have to spend an entire day registering for classes, thanks to a new voice response system that lets them enter course selections via telephone.

The university's Voice Response Registration (VRR) system not only allows some 35,000 students to sign up for classes in minutes, it also eliminates the need to hire seasonal help and pay staff overtime to complete the tedious registration process.

"The whole process has been streamlined tremendously, and students, administrators and faculty love it," said Mary Ann Dase, telecommunications director for CSULB.

"The system makes registration more efficient and allows faculty and administrators to better plan course offerings because they have a quicker and more accurate assessment of which classes are filling up and which aren't," she said.

Campus administration building

Future applications

Although VRR is being used primarily for registration, Dase said it will eventually provide students and administrators with on-line information on financial aid, grades, program status and course evaluations.

The VRR system uses Information Associate, Inc. software on two 32-port Perception Technology Corp. COCOM 1 and one 32-port VOCOM 30 voice processing systems linked to an IBM 3090-180, where all registration and student information is housed.

Students are assigned an initial time to call into the system and two call-back dates.

During the initial phase of

(continued on page 29)

BOOK REVIEW

BY ERIC SCHMALL

Guide gives LAN users the basics and more

The Business Guide to Local-Area Networks, William Stallings (Carmel, Ind.: Howard W. Sams & Company, 1990), $24.95.

If this isn't the first book on LANs that an individual should read, it should certainly be the second.

This book works well as a comprehensive survey of local-area network technologies and architectures. Its level of detail puts the book beyond the category of a LAN primer and distinguishes it as a well-written text for anyone who understands the rudiments of LANs and is ready to delve deeper.

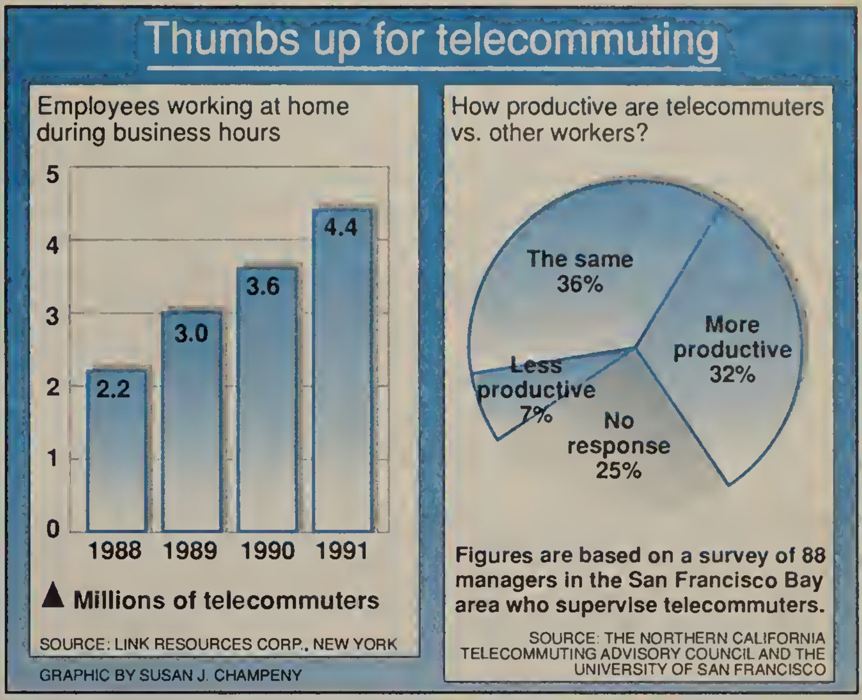
The author is a London-based consultant and instructor in LAN technologies who has written eight other books on computer technology and data communications, including a three-volume set on communications standards. Stallings' experience shines through in this latest effort, which provides a clear overview of LAN technologies and architectures.

Stallings wrote this book in response to the rapid deployment of LANs in the business world. LAN proliferation has created a desperate need for nontechnical managers and decision makers to understand this revolutionary change in how information is processed and transported.

The book makes good use of business cases to illustrate the major principles outlined in each chapter. Culled from trade

(continued on page 29)

Stallings is a London-based consultant for LAN technologies.



SOURCE: LINK RESOURCES CORP., NEW YORK

Figures are based on a survey of 88 managers in the San Francisco Bay area who supervise telecommuters.

SOURCE: THE NORTHERN CALIFORNIA TELECOMMUTING ADVISORY COUNCIL AND THE UNIVERSITY OF SAN FRANCISCO

GRAPHIC BY SUSAN J. CHAMPENY

Users need to adopt telecommuting plans

Net managers must find a way to provide tools needed by those who choose to work at home.

By Wayne Eckerson
Senior Editor

Although few companies have adopted formal telecommuting programs, network managers agree that the number of employees working at home will increase in the near future, making it imperative for them to begin drafting a telecommuting strategy now.

An effective strategy will bring together the network tools and services needed to support the different information and communications needs of work-at-home employees.

"In the financial industry, traders and dealers are looking to extend their trading day by working from home. We need to provide the right equipment to make this possible," said Thomas Festa, network manager at Liberty Brokerage, Inc. in New York.

According to LINK Resources Corp., a market research firm in New York, there are about 4.4 million telecommuters in the U.S., a figure that has grown about 20% a year since 1988 (see graphic, this page).

Currently, many telecommuters use laptop or personal computers to dial into host computers and retrieve messages or update files. Most either charge voice calls to their company calling card or get reimbursed for the calls later.

But in recent months, network vendors have unveiled new tools designed to make it easier for firms to support telecommuters.

In January, AT&T announced Home Agent, software for automatic call distributors that enables companies to route incoming calls and data to customer service agents working at home ("AT&T ACD package routes calls to homebound agents," *NW,* Feb. 4). This will enable companies to recruit or maintain agents who need to stay at home to care for a small child or elderly person, for example.

In addition, some carriers now provide switched access to their virtual network services. This allows companies to extend their virtual networks to employees' homes, making it less costly for telecommuters to make business calls from their homes ("Users extend virtual nets to include worker homes," *NW,* Dec. 31/Jan. 7).

> Vendors have unveiled tools to make it easier for firms to support telecommuters.
>
> ▲▲▲

Jeff Hafer, telecommunications manager at General Public Utilities Service Corp. in Reading, Pa., said net managers will need to tailor facilities to meet the communications needs of telecommuters while keeping an eye on costs.

For telecommuters who are geographically dispersed and do not need immediate access to a large amount of data, companies can arrange to provide dial-up or

(continued on page 28)

Telecommuting not for everyone

While telecommuting promises to increase worker productivity and reduce pollution by keeping people off the roads, it's not for everyone.

Employees most likely to telecommute are those who require little interaction with office mates, including workers involved in gathering and analyzing lots of data and those who have proven to be reliable when handling projects and meeting deadlines on their own.

At Pacific Bell, for example, most of the 2,000 telecommuters are financial specialists who crunch a lot of numbers, said Carol Nolan, telecommuting manager at the company. But there are also others who participate in the program, which has been in existence since 1985.

Most Pacific Bell telecommuters work at home just one or two days a week and are in the office the rest of the time. This ratio of home-to-office work time helps to avoid feelings of isolation that sometimes plague telecommuters.

Charles Grantham, an assistant professor at the University of San Francisco and former director of research and development for Pacific Bell, said the key to implementing successful telecommuting programs is to train managers.

They have to be taught to manage employees' work quality and not their time, Grantham said. With telecommuters, managers have to be especially careful to describe the work that needs to be done, when it should be completed and how it will be measured.

"Telecommuting is bound to grow, but it must be tailored to meet the needs of each individual and task involved," Grantham said.

— *Wayne Eckerson*

Users need to adopt telecommuting plans

continued from page 27

virtual services.

But when telecommuters are concentrated in a single locale and are heavy computer users, companies may want to lease a dedicated line to a central point in the neighborhood, Hafer said. Companies could have employees report to a satellite office, where the facilities terminate, or they could run tail circuits to workers' homes.

Hafer added that network managers need to persuade companies to carefully examine whether the benefits of telecommuting outweigh increased communications costs.

John Crankshaw, telecommunications manager at Steelcase, Inc. in Grand Rapids, Mich., said giving telecommuters access to the company's virtual net could lower network expenses. Virtual network calls would cost less than credit card or direct-dial calls, and by increasing traffic volume, the company could qualify for larger volume discounts from its virtual network provider. However, AT&T needs to distinguish between personal calls and business-related calls made by an employee on the virtual network and send out separate bills for each, Crankshaw said.

According to most net managers, technology still needs to advance before working at home is as convenient as working at the office. For example, users need a way to forward calls to another employee if the telecommuter isn't home or is on the phone. Also, there is no easy way to tie a telecommuter into a company's electronic mail and voice mail systems.

While net managers are sorting out the technical issues, they are also weighing the possibility of telecommuting.

"I'm on the phone all day talking with vendors about pricing and equipment and [talking with] others about network designs and other things. That could easily be done at home," Liberty's Festa said.

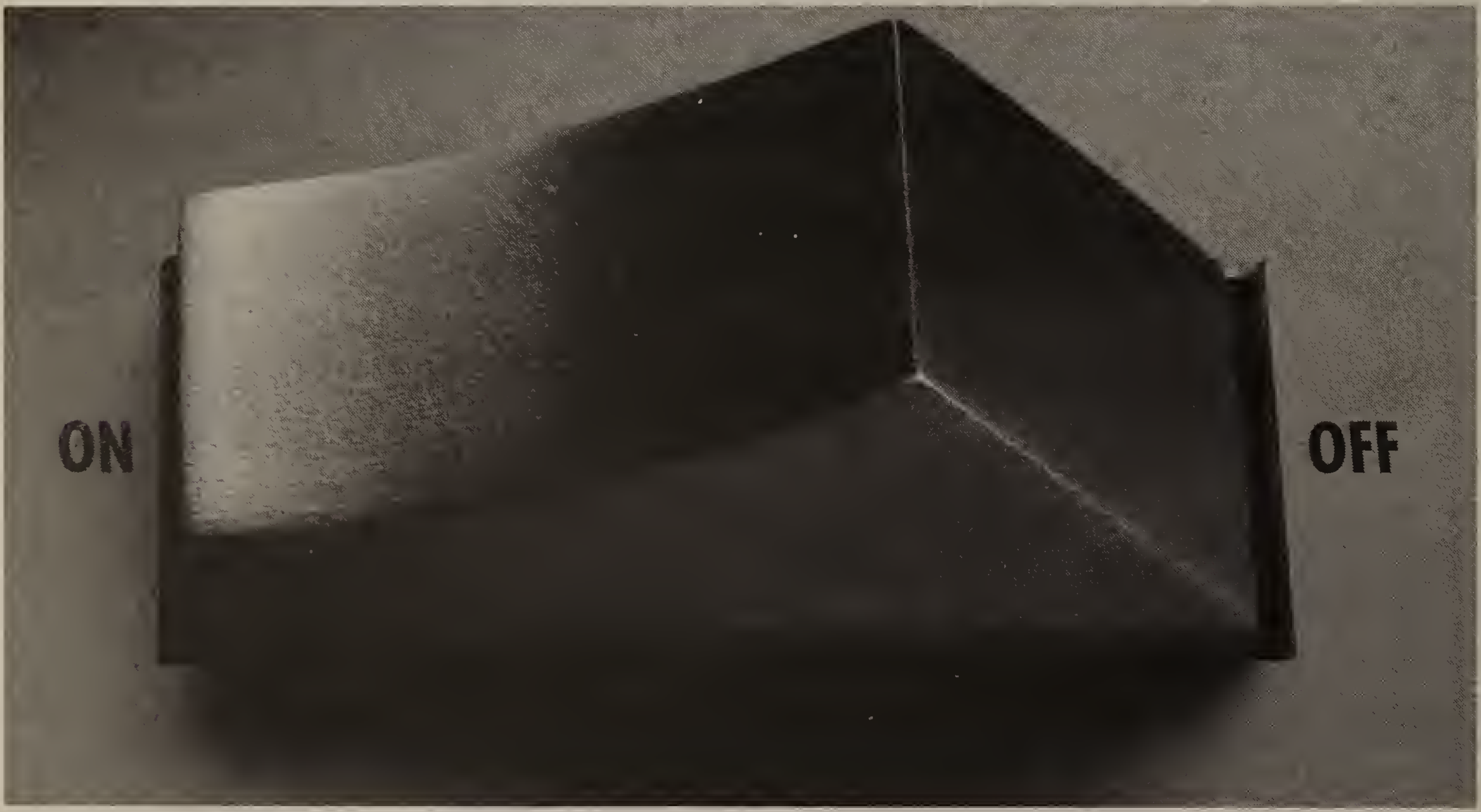
Hafer agreed. "I could be much more productive if I could work at home two days a week," he said, adding that he would use the time at home to write reports, review design specifications and other work that requires a lot of concentration.

According to a study by the consulting firm Arthur D. Little, Inc., telecommuting could help save the U.S. $23 billion annually in transportation, environmental and energy costs.

The study stated that the U.S. could eliminate 1.8 million tons of pollutants, save 3.5 billion gallons of gasoline and free up 3.1 billion hours of workers' time each year if there is a 10% to 20% increase in the number of activities carried out through telecommunications rather than transportation. Besides telecommuting, this includes teleshopping, teleconferencing and electronic business exchanges.

The Bush administration recently implemented a telecommuting program for its own work force called Flexiplace. The program outlines a set of guidelines to help federal managers establish telecommuting programs in their departments.

Many companies in California are implementing telecommuting programs, spurred largely by state clean air legislation that requires large companies to draw up plans to reduce the number of vehicles used by employees for transportation to work or face stiff fines. ◪



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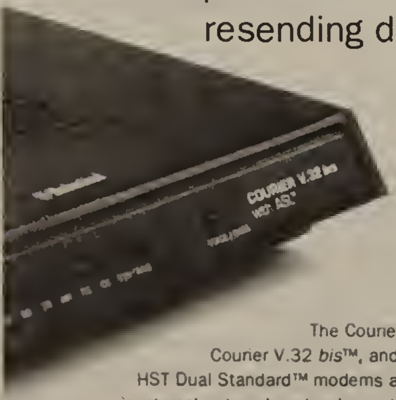

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Voice response simplifies

continued from page 27

registration, the VRR is available 12 hours a day, Monday through Saturday. Registration is done over a two week period starting with graduate students and seniors.

The voice response system leads the student through the registration procedure step-by-step. By entering numbers on a push-button phone, students can add or drop classes, choose secondary classes if a selected class is closed, verify fee statements and check current mailing addresses.

A lockout can also be placed on a student's access code if an advisor or other college official needs to speak with students before they schedule courses.

Calls come into the VRR directly or through the school's Ericsson MD 110 private branch exchange. Local carriers GTE West and Pacific Bell monitor traffic levels on incoming lines.

Students who register from a campus telephone dial into the school's PBX, while calls from off-campus telephones are routed to the VRR via the public network.

Managing the call load is an important priority, Dase said. The goal is to keep ports on the VRR busy during appropriate times and yet protect the network from overloads.

Donald Van Doren, president of Vanguard Communications Corp., a telecommunications consultancy in Morris Plains, N.J., said more than 200 telephone registration systems have been installed in colleges since the mid-1980s.

"The tremendous savings you get from the system, both in terms of time and staffing costs, has made the application a very popular one with college administrators," said Van Doren. He predicted that most large universities in the U.S. will have similiar telephone registration systems by the end of the decade. ◻

Association Watch

continued from page 27

In conjunction with the ICA's conference, the **International Communications Association** will hold an executive seminar on June 4 at the Marriott Hotel in Anaheim, Calif., for senior corporate managers involved in finance and operations who want to learn more about the strategic use of network technologies.

The one-day seminar, cosponsored by *CIO Magazine*, will include presentations on the strategic positioning of telecommunications, the economics of planning a telecommunications infrastructure and the use of outsourcing.

Registration is free for ICA member companies and $250 for nonmember companies.

Write to ICA Executive Seminar, 12750 Merit Drive, 710 LB-89, Dallas, Texas 75251, or call (800) 422-4636. ◻

Guide gives the basics and more

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journals such as *Network World*, the case studies describe how organizations such as the *Houston Chronicle*, Ohio University and Boeing Computer Services Co. solved problems of LAN internetworking and management and sorted through standards.

The book also contains a particularly intriguing chapter on the potential role of image technology in the LAN environment. Stallings asserts that image technology will have an unprecedented impact on the way companies do business and, therefore, on underlying LAN structures. Because image documents consume so much bandwidth, all LANs will need to run at Fiber Distributed Data Interface speeds of 100M bit/sec or higher in the future.

The book makes good use of illustrations so even abstract concepts, such as the Open Systems Interconnection protocol stack, are easy to understand.

For professionals who are familiar with LAN basics and are ready to wade into the deeper waters, this book provides an inviting and rewarding next step. ◻

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World News

On March 1, **Switzerland's Post, Telegraph and Telephone** administration significantly lowered its rates for international, digital, private leased circuits.

For example, prices for 56K and 64K bit/sec fiber-optic circuits to the U.S. were reduced by 31%, to 6,180 Swiss francs ($4,511) per month.

Prices for 128K bit/sec fiber-optic circuits to the U.S. fell by 23%, to 10,835 Swiss francs ($7,910) per month; 384K bit/sec fiber prices fell by 16%, to 28,420 Swiss francs ($20,746) per month; 768K bit/sec fiber circuit rates fell by 21%, to 42,630 Swiss francs ($31,194) monthly; and fiber-optic T-1 prices fell by 18%, to 61,800 Swiss francs ($45,114) per month.

Price declines for dedicated International Business Service (IBS) satellite circuits were even greater.

Charges for 56K and 64K bit/sec IBS circuits fell by 40%, to 5,440 Swiss francs ($3,971) per month, 128K bit/sec IBS circuit prices fell by 32%, to 9,530 Swiss francs ($6,951) per month, 384K bit/sec IBS circuit prices dropped 27%, to 25,000 Swiss francs ($18,250) per month, while IBS T-1 circuit prices fell 28%, to 54,375 Swiss francs ($39,694) per month.

A spokesman for the Swiss PTT's U.S. representative, Swiss Telecom North America in Washington, D.C., said the Swiss carrier is reducing international private-line rates to move prices closer to provisioning costs and to respond to competitive pressure. ☐

Telesat Canada to launch satellite to bolster service

Will give users greater access to sites in U.S.

By Ellen Messmer
Washington Correspondent

GLOUCESTER, Ontario — Telesat Canada, the country's monopoly domestic satellite services provider, next month will launch the first of two new satellites, significantly expanding its U.S. reach to users.

The addition of the Anik E class satellite will give Telesat Canada and its customers the equivalent of the full U.S. and Canada satellite coverage currently offered by GTE Spacenet Corp. and Contel ASC, whose satellite footprints extend from the U.S. across Canada. This will enable users in Canada to establish direct communications with sites anywhere in the contiguous 48 U.S. states.

Richard Jestin

Telesat Canada's satellites now only offer service across Canada and portions of the U.S., extending south to Tennessee.

Richard Jestin, Telesat Canada's director of telecommunications services, said one dual-band Anik E satellite combines the equivalent Ku- and C-band services offered by Anik C and D satellites.

The Anik E class, like the Anik D, will provide C-band uplink/downlink transmissions at 4 GHz and 6 GHz. And like the Ku-band C series, Anik E will provide Ku-band uplink/downlink transmission at 14 MHz and 16 MHz.

The two Anik E satellites — the second of which will be launched in July by Arianespace, a European consortium — offer the same capacity as the current five C and D class satellites now in orbit. The Anik E also provides the same transmission speeds, ranging from 9.6K bit/sec to T-1.

The five older C and D class satellites, which are expected to run out of fuel soon, will fall from their geostationary orbits but still remain useful in an inclined orbit, where they will be used as a backup by Telesat Canada.

Jestin said rival U.S. carriers all have full C- and Ku-band coverage of Canada, allowing them to transport satellite traffic originating in the U.S. directly to any point in Canada.

But due to current satellite limitations of the older Anik C satellite, Telesat Canada was forced to lease U.S. satellite capacity in order to transport satellite signals to some U.S. destinations, Jestin said. This affected users because while Telesat Canada could deliver the signal to a final destination in the U.S., users had to deal with U.S. service providers for equipment.

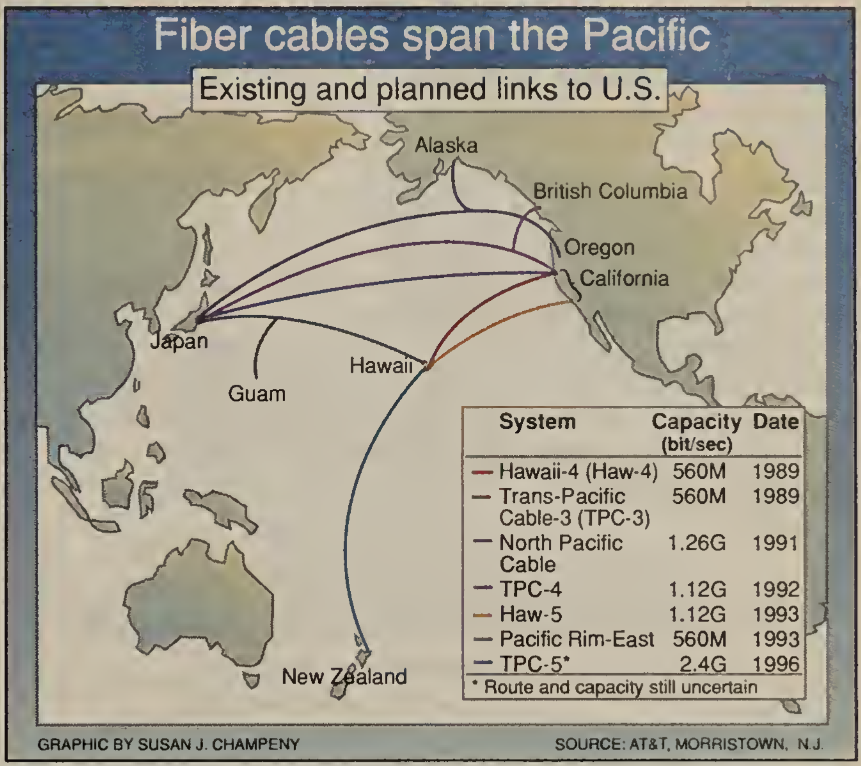
Because it can now provide direct service to endpoints in the U.S., users may see some savings on service rates, a spokesman said.

Satellite users said they look forward to the improved Anik E coverage. Bill Coopman, telecommunications manager at Deere & Co., said the upgrade will enable users to deal solely with Telesat Canada instead of a sec-

(continued on page 32)

Fiber cables span the Pacific

Existing and planned links to U.S.



System	Capacity (bit/sec)	Date
Hawaii-4 (Haw-4)	560M	1989
Trans-Pacific Cable-3 (TPC-3)	560M	1989
North Pacific Cable	1.26G	1991
TPC-4	1.12G	1992
Haw-5	1.12G	1993
Pacific Rim-East	560M	1993
TPC-5*	2.4G	1996

* Route and capacity still uncertain

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: AT&T, MORRISTOWN, N.J.

Transpacific cable to provide lower rates

Latest U.S.-Asia connection will support more traffic than others, reducing prices for users.

By Barton Crockett
Senior Editor

VANCOUVER, Wash. — A new transpacific fiber-optic cable scheduled to commence operations next month is expected to cut costs and improve disaster recovery capabilities for users operating private networks between the U.S. and Asia.

The new North Pacific Cable (NPC) gives users a second fiber route to the Pacific Rim. One international network user, BankAmerica Corp., is considering taking advantage of that redundancy to streamline its data processing operations for major savings.

In addition, some carriers are charging less for private lines on NPC because they're paying less to buy bulk capacity on the system. NPC cost less to install and supports more traffic than the other transpacific fiber cable now in operation, Hawaii-4/Trans-Pacific Cable-3 (see graphic, this page). "Because of the lower cost, we're looking to provide services at a lower rate," said Leo Vozel, director of network marketing at World Communications, Inc. (WorldCom), a New York-based international carrier.

Vozel said WorldCom will charge 15% to 25% less for private lines on NPC than for equivalent private lines on Haw-4/TPC-3. TRT/FTC Communications, Inc. in Washington, D.C. said it is charging 20% to 25% less for private lines on NPC.

Stephen Lovas, president of Pacific Telecom Cable, Inc., which is based here and owns and operates the American half of NPC, said the new fiber cable is currently being tested and is

(continued on page 32)

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Transpacific cable to provide lower rates

continued from page 31

scheduled to begin service in April. Lovas said about half of NPC's capacity has already been sold to some 27 carriers, including virtually all major North American carriers.

Carriers are purchasing the capacity directly from Pacific Telecom Cable and the owners of the Japanese half of the system, Tokyo-based International Digital Communications, Inc. and London-based Cable & Wireless PLC.

According to Lovas, carriers can offer lower rates for private lines on NPC primarily because NPC bandwidth is cheaper than Haw-4/TPC-3 bandwidth.

NPC cost about $500 million to construct and supports a total capacity of 1.26G bit/sec. By contrast, Haw-4/TPC-3 cost $700 million to construct but only supports a total capacity of 560M bit/sec, assuming that AT&T, which controls the system, continues to reserve 280M bit/sec of capacity for disaster recovery purposes.

> Carriers can offer lower rates for private lines primarily because NPC bandwidth is cheaper than Haw-4/TPC-3 bandwidth.
>
> ▲▲▲

This means that the provisioning cost per circuit is about twice as high on Haw-4/TPC-3 as on NPC.

At least one WorldCom user, Digital Equipment Corp., expects to save 15% by moving a 128K bit/sec circuit from Haw-4/TPC-3 to NPC.

"We've been planning this ever since we first leased the circuit," said Robert Rich, DEC's group manager for international telecommunications in Acton, Mass.

But not every carrier is offering users a discount for NPC service. For example, AT&T said it will charge the same price regardless of the fiber cable supporting a user's circuit. AT&T officials said NPC provisioning costs will be averaged in with other costs to calculate overall international private-line pricing.

MCI Communications Corp. is also not offering an NPC discount. US Sprint Communications Co. is planning to use NPC to offer its first international private-line service to Asia and does not plan to provide service over Haw-4/TPC-3.

Out of Hong Kong

John Macri, a vice-president for telecommunications at BankAmerica, said NPC could help the bank save a significant amount of money by enabling it to merge its Hong Kong data center operations into its London data center.

Currently, BankAmerica uses the Hong Kong data center to support the data processing needs of operations in the Pacific Rim. If the data center were moved to London, Pacific Rim users would be linked via dedicated lines into a Hong Kong network hub, which would be connected via redundant private lines on NPC and Haw-4/TPC-3 into BankAmerica's U.S. private net.

The U.S. network, in turn, would route Hong Kong traffic via redundant transatlantic fiber links to the London data center. That would give the bank redundant fiber links between Hong Kong and London.

Macri said BankAmerica could not do the consolidation without maintaining redundant fiber-optic routing. Satellite circuits would lead to unacceptable propagation delays, he said.

Macri emphasized that no decision has been made on the consolidation. But he said existing mainframes in London could easily handle much of the Hong Kong DP requirements. Because of time zone differences, Macri said, London's DP demands dwindle when Hong Kong's peak.

Telesat Canada to launch satellite

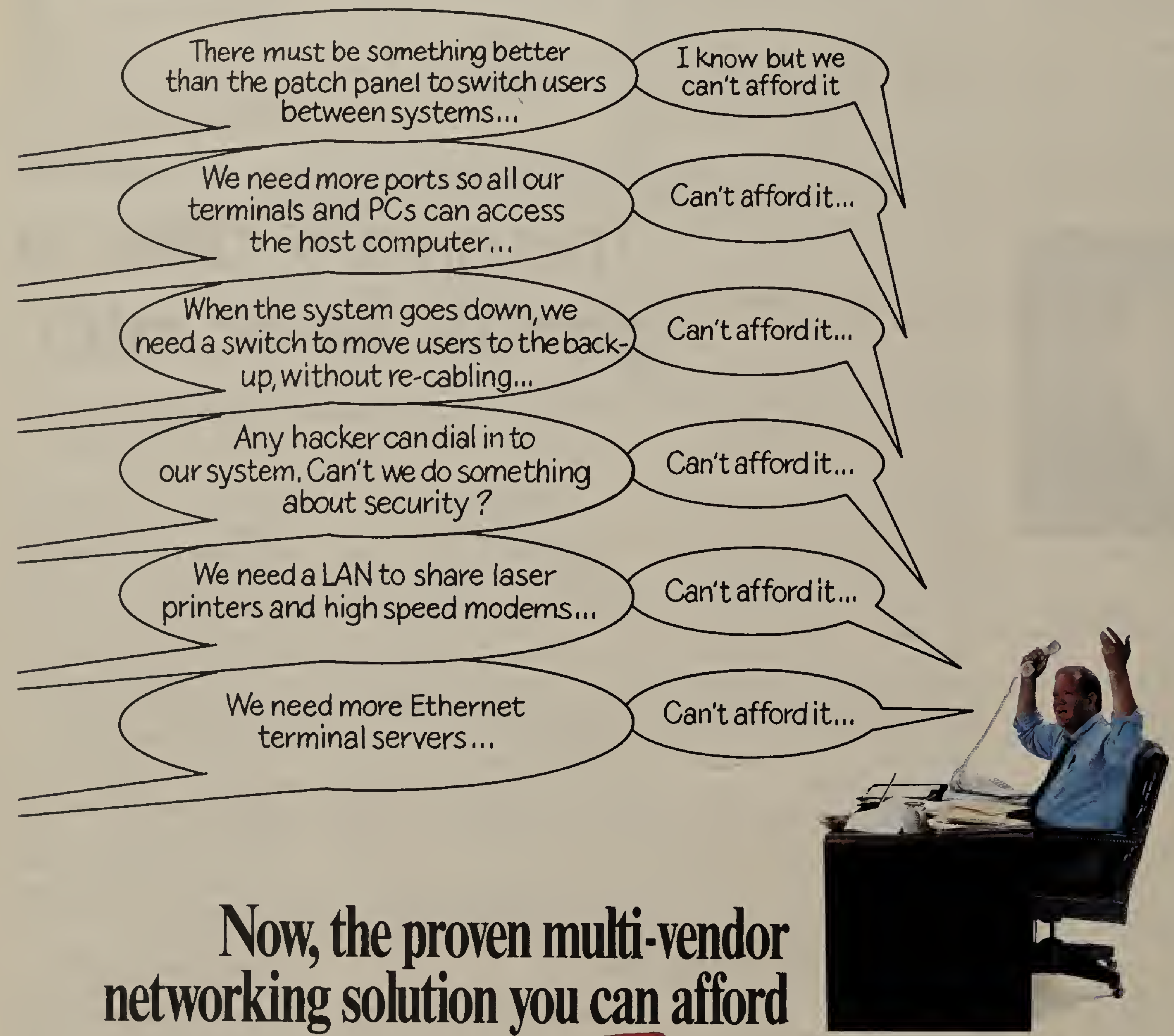
continued from page 31

ond satellite services provider in the U.S.

Deere is establishing a network of earth stations in the U.S. and Canada for its associated dealerships. But Coopman pointed out that Telesat Canada's improved transport capability alone would not eliminate general dissatisfaction with the carrier's service. He pointed to Telesat Canada's slow responsiveness to requests for earth station cutovers and maintenance as one area in which Telesat Canada could improve.

Mairi MacDonald, director of the regulatory office at the Canadian Business Telecommunications Association, blamed the monopoly environment in Canada for complaints the association has often heard concerning Telesat Canada's service.

She pointed to the transborder regulations worked out between Canada and the U.S., which divide the markets and are designed to protect the domestic carriers. Canadian users want to see more competition and use the U.S. carriers if they choose," MacDonald said.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PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Novell rolls out low-end version of LANtern

Novell, Inc. recently announced the release of **LANtern LTD,** a low-end version of its LANtern network monitor designed for networks of as many as 32 devices. The original LANtern has no node limitations.

According to Novell, LANtern LTD offers customers full LANtern functionality — including support for the Simple Network Management Protocol (SNMP) — but at a more affordable price.

LANtern LTD gathers statistics on network performance, monitors faults and collects trend information. It can relay data across bridges and routers, enabling a user to conduct central site testing of remote local-area networks. The LANtern network monitors interoperate with products from more than a dozen companies, including Cabletron Systems, Inc., Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc.

LANtern LTD is available now from Novell LANalyzer authorized distributors for $2,495. The standard version of LANtern costs $4,495.

Novell, Inc., (801) 429-5833.

Lantana cards feature bus master technique

Lantana Technology, Inc. has introduced a family of 16M bit/sec token-ring interface cards for XT, AT and Micro Channel-based personal computers. The **Cypress/16** cards feature what the company described as a second-generation bus master design.

Bus mastering is a technique that improves local-area network throughput of AT-class and Micro Channel personal computers by enabling the LAN card to operate independently and concurrently with operations of the machine's central processor.

The Cypress/16 controllers offer 128K bytes of buffer memory and support unshielded twisted-pair wiring as well as shielded twisted-pair. The cards feature diagnostic LEDs for troubleshooting and an optional capability that lets

(continued on page 34)

ODS hubs manage Ethernet, token ring simultaneously

Products sport independent backplane buses.

RICHARDSON, Texas — Optical Data Systems, Inc. (ODS) recently announced three hubs that can simultaneously support token ring and Ethernet, enabling users to manage either type of local-area network from a single workstation.

All three chassis-based products are outfitted with independent backplane buses for Ethernet and token-ring modules that slide in from the front.

The ODS 295 has one of each type of backplane and 12 slots, while the 12-slot 296 has one token-ring bus and three Ethernet backplanes. The low-end ODS 292 has one of each type of bus and four slots.

The company offers a variety of Ethernet and token-ring multiport modules for the hubs, including modules for coaxial cable, thin coaxial cable, fiber optics, and unshielded and shielded twisted-pair wire.

Both 4M and 16M bit/sec token-ring modules are available and range in size to as many as 12 ports.

Using 12-port modules, the ODS 295 can support as many as 132 managed Ethernet or 136 managed token-ring ports. Alternatively, the box can be configured with stand-alone modules to support 12 independent, 12-port Ethernet or token-ring networks, but this eliminates the ability to communicate between modules.

The token-ring bus in the ODS 295 can be partitioned with the flip of a switch to support as many as three token-ring subnetworks, dedicating four module bays to each.

The device can also be configured to support two token-ring subnets — one with eight module slots and the other with four.

While the token-ring bus in the ODS 295 is the same as that in the ODS 296, the latter has three Ethernet backplanes, which let customers create similar subnets in the Ethernet environment.

The chassis can be used to support one 132-port network, 12 separate networks or to segregate traffic into three subnets, each of which would consist of four module bays.

The ODS 292 provides features similar to those of the ODS 295 but only has four slots.

All three machines can be managed using ODS 592, a DOS-based management system that provides alarm and control capabilities for both types of LAN environments.

With token ring, for example, the system enables net administrators to turn ports on and off, loop back ports on media access units (MAU) and change the MAUs' operating mode. It can also pass up MAU status informa-

(continued on page 35)

Firm offers new UPS units and monitoring software

WEST KINGSTON, R.I. — American Power Conversion Corp. recently announced three uninterruptible power supply (UPS) units for local-area network equipment and upgraded server software that enables users to monitor the performance of their utility power lines.

The new power units include additions to the company's Smart-UPS series, devices rated at 900, 1,250 and 2,000 volt-amps.

These machines, the Smart-UPS 900, 1250 and 2000, can be used to protect multiple devices, such as servers, workstations and intelligent hubs.

The Smart-UPS 900 will run two IBM Personal System/2 Model 80 file servers for 11 minutes after a power outage, while the 1250 will feed the same machines for 17 minutes and the 2000 will keep them going for 35 minutes before powering them down gradually.

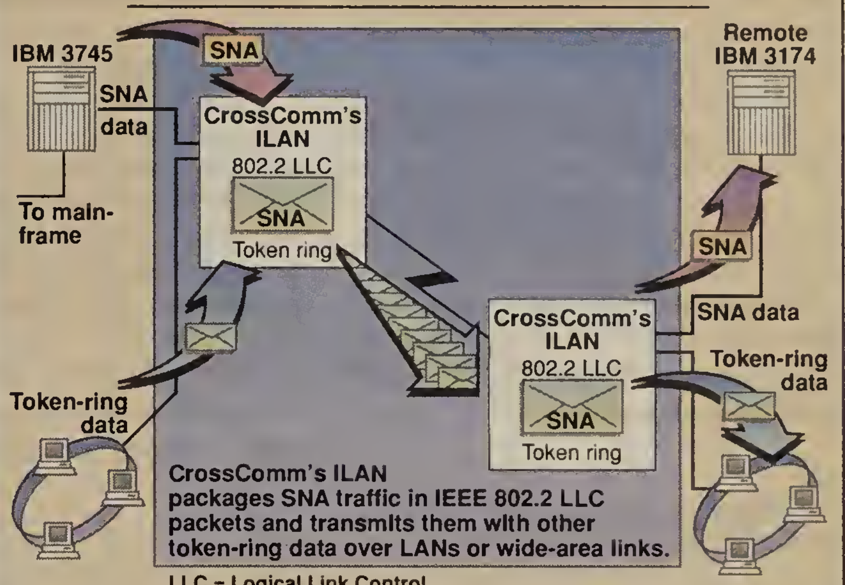
Following in the footsteps of earlier models in the Smart-UPS line — which includes the Smart-UPS 400 and 600 — the new devices support a number of features, which include site wiring fault indicators that alert users to two common wiring problems, grounding problems with electrical equipment or reversed polarity.

The new models also have load meters to help users determine how much equipment can be plugged into the UPS, preventing overloading and downtime caused by a tripped circuit breaker in the UPS.

The Smart-UPS 900, 1250 and

(continued on page 35)

Combining SNA and LAN data



LLC = Logical Link Control

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: CROSSCOMM CORP., MARLBOROUGH, MASS.

CrossComm adds SNA support to ILAN

Merges SNA data onto existing token rings, WANs, negating need to maintain separate SNA networks.

By Charles Bruno
Assistant Managing Editor

MARLBOROUGH, Mass. — CrossComm Corp. last week announced a software option for its ILAN routing bridges to route IBM Systems Network Architecture traffic over token-ring local-area networks or wide-area links.

The addition of SNA protocols to CrossComm's ILAN will enable users to merge SNA data onto existing token rings or wide-area network backbones instead of maintaining separate SNA links, thereby reducing telecommunications costs.

By adding SNA support to the ILAN line, CrossComm joins a growing list of internetworking vendors that have announced support for IBM SNA protocols, making it easier for users to support multiprotocol backbones.

Users can add the SNA support via addition of an ILAN module, which updates the routing software that resides on its ILAN units, according to Tad Witkowicz, CrossComm's president.

ILAN units can now route IBM Synchronous Data Link Control and High-Level Data Link Control protocols by packetizing the traffic in IEEE 802.2 Logical Link Control packets for transmission across token-ring networks.

IBM cluster controllers or front-end processors are attached to local ILANs (see graphic, this page). An ILAN can recognize and packetize traffic coming from a 3174 controller, for instance, while also appending the address of another downstream ILAN attached to an SNA device so the data can be routed to the correct location.

Since a 3174 always communicates through the same front-end processor, the ILAN attached to the cluster controller tags packets coming from the 3174 with the port address of the front-end processor.

"We're letting network managers set up their SNA routing on a port-by-port basis," Witkowicz said. The benefit is that users can share the costs of a wide-area link between SNA and LAN traffic.

> "We're letting network managers set up their SNA routing on a port-by-port basis."

▲▲▲

This is analogous to AppleTalk tunneling offered by some users to pass Apple Computer, Inc. AppleTalk traffic through Transmission Control Protocol/Internet Protocol networks.

As many as five SDLC connections can be supported by the ILAN. In point-to-multipoint connections between ILANs, SDLC traffic can be routed to several locations.

In the event that packetized SNA data must be sent over an X.25 network, the token-ring packets are packetized into X.25 format for transmission across the wide-area net and are later stripped of the X.25 envelope and handed off to a local ILAN. That

(continued on page 35)

First Look

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users to boot from the server when the card is installed in a diskless workstation.

Software drivers for Novell, Inc.'s NetWare 2.1X, IBM's PC LAN Program and Microsoft Corp.'s LAN Manager are included with the cards.

The Cypress/1-16 for IBM Personal Computers and Personal Computer XTs sells for $845; the Cypress/2-16 for Micro Channel-based Personal System/2s and the Cypress/3-16 for IBM Personal Computer ATs each sell for $895.

Lantana Techology, Inc., 4393 Viewridge Ave., Suite A, San Diego, Calif. 92123; (619) 565-6400; fax: (619) 565-0798.

Telemax mux supports compressed voice circuits and data ports

Telemax Corp. recently unveiled its **Dawn 2200** multiplexer, which enables a user to transmit two compressed voice circuits and two data channels over a single 56K bit/sec digital line.

The multiplexer, which features an integral 56K bit/sec data service unit/channel service unit, supports either two voice circuits and two 9.6K bit/sec RS-232-C/D data ports or two voice circuits and one 19.2K bit/sec RS-232-C/D data port.

The device converts standard analog voice circuits to 16K bit/sec adaptive differential pulse code modulation (ADPCM) digital voice signals. The ADPCM circuits can also support analog data transmission and Group III facsimile. Voice interfaces support all private branch exchange and central office switch standards.

The Dawn 2200 is available now for $2,495.

Telemax Corp., 1938 University Lane, Suite C, Lisle, Ill. 60532; (708) 241-0909; fax: (708) 241-0943.

MiCC 9620 V.32 modem lets users achieve V.42bis data compression

Micro Integrated Communications Corp. (MiCC) has introduced the **MiCC 9620,** a V.32 modem that supports V.42bis data compression.

According to company officials, the MiCC 9620 can be configured to work with any operating system independent of communications software when connected to a serial port. It features a keypad and internal software that enable a user to control all functions from a menu.

V.42bis compression enables users to achieve a 38.4K bit/sec throughput rate. The device features a 16-bit microprocessor, four-wire leased-line support with dial backup, and two-level password and call-back security. The 9620 supports Link Access Procedure M and Microcom Network Protocol error correction through Level 5.

The MiCC 9620 lists for $1,395 and is available now through resellers and distributors.

Micro Integrated Communications Corp., 3255 Scott Blvd., Bldg. 3, Suite 102, Santa Clara, Calif. 95054; (408) 980-9565; fax: (408) 980-9568.

Megahertz's new adapters allow IBM 3270 or 5250 terminal emulation

Megahertz Corp. has announced two external adapters that give notebook computer users either IBM 3270 or 5250 terminal-emulation capabilities.

The **3270 Terminal Emulation Adapter** provides access to IBM mainframes, while the **5250 Terminal Emulation Adapter** provides access to IBM System/34/36/38 and Application System/400 minicomputers.

The adapters utilize a laptop's 100-pin expansion bus connector. The 3270 adapter comes with Chips and Technologies, Inc.'s IND$FILE Transfer and 3270 emulation software support. It supports all Irma II and IBM emulation software, and is compatible with IBM 3174, 3274 and 3276 controllers.

The 5250 adapter comes bundled with Andrew Network Products' 3XTwin terminal-emulation software, which enables users to toggle between DOS and 5250 functions, and supports the IBM Application Program Interface and AS/400 PC Support package.

The 3270 and 5250 adapters are priced at $799 and $999, respectively, and are expected to ship in early April.

Megahertz Corp., 4505 S. Wasatch Blvd., Salt Lake City, Utah 84124; (801) 272-6000.

Tandberg offers tape backup for NetWare, LAN Manager, Unix LANs

Tandberg Data, Inc. recently announced its Panther line of ¼-in. tape backup systems for Novell, Inc. NetWare, Microsoft Corp. LAN Manager and Unix local-area networks.

Until now, Tandberg has been an OEM supplier of Quarter Inch Cartridge (QIC) backup systems to IBM and other vendors, providing tape backup for the IBM Application System/400 minicomputer and RISC System/6000 workstations. The Panther represents Tandberg's first effort at selling to end users. The systems are based on Tandberg Data Cartridge (TDC) 3600 and TDC 3800 QIC tape drives.

The new Panther tape backup systems are offered in either internal or external units, the former of which can fit into a file server.

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The systems provide from 60M to 525M bytes of storage capacity. Backup/restore rates range from 5M to 12M byte/min on minimum and maximum capacity models, respectively.

The high-end TDC 3800 model is capable of backing up 525M bytes in less than 45 minutes.

The tape backup systems attach to a LAN server via a Small Computer System Interface connection.

Prices range from $995 for a 60M-byte TDC 3600 internal system to $2,695 for a TDC 3800 external subsystem with 525M bytes of storage.

Tandberg Data, Inc., 2649 Townsgate Road, Westlake Village, Calif. 91361; (805) 495-8384.

CrossComm adds SNA support to ILAN

continued from page 33

ILAN then splits off SNA traffic from token-ring traffic and routes it accordingly.

Witkowicz said there are other, less tangible benefits. Users with 3274 cluster controllers that do not directly attach to token-ring LANs can link the devices to an ILAN and route SNA data to a host site over a token-ring net.

"We're offering a way to extend the life of a 3274. IBM's not going to do that because it's in the business of selling iron," Witkowicz said. "It would rather sell you a new controller than a LAN attachment for the old unit."

Another benefit of the ILAN is that it improves response times for terminals attached to cluster controllers, Witkowicz said. By routing data over an ILAN, users can send 3270 terminal traffic over 56K bit/sec lines instead of 9.6K bit/sec leased lines supported by IBM controllers.

Routing

CrossComm said the SNA routing feature is available now, unlike Cisco Systems, Inc., which said it will support SNA traffic but will not be available until next year. Wellfleet Communications, Inc. also has promised SNA routing support but has not specified a delivery date.

Bryce Morgan, a technology consultant with Union Carbide Corp. in Danvers, Conn., said his firm is interested in the SNA pass-through capability and will test the software later this year.

Union Carbide has a number of sites that pass SNA and X.25 traffic to a research and development center in Buffalo, N.Y. The company would like to combine that traffic onto a single backbone.

"We think it would be interesting to let the ILAN be the bandwidth manager, instead of partitioning a backbone in static blocks dedicated to X.25, SNA and LAN traffic," Morgan said.

The SNA software option costs $2,000 per ILAN for CrossComm customers.

For further information, contact CrossComm at 140 Locke Drive, Marlborough, Mass. 01752, or call (508) 481-4060.

Firm offers new UPS units, monitoring

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2000 list for $999, $1,299 and $1,999, respectively.

Some of the other capabilities of the new boxes will be unleashed by the new version of the company's PowerChute software for Smart-UPS. The enhanced product enables users to diagnose the causes of mysterious crashes, reboots or keyboard lockups by keeping a real-time and historical record of a site's power quality.

The software is installed on the server, which is then connected to a Smart-UPS via a communications link. PowerChute can be used with Novell, Inc. NetWare for DOS, NetWare 286 and NetWare 386.

Users can track a number of items concerning site power quality, including UPS operating temperature, utility line frequency, UPS output voltage, utility line maximum and minimum power, battery strength, line voltage and UPS load, the company said. Tests can be done in real time or logged and then later exported into Lotus Development Corp.'s 1-2-3 or Microsoft Corp.'s Excel spreadsheets for analysis.

PowerChute costs $99 and is scheduled for shipment this quarter.

American Power Conversion can be reached at P.O. Box 278, 132 Fairgrounds Road, West Kingston, R.I. 02892, or call (401) 789-5735.

ODS hubs manage simultaneously

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tion to IBM's NetView network management system through NetView/PC.

For Ethernet, the management product supports the Simple Network Management Protocol and, beyond that, enables users to set alarm thresholds and monitor for conditions such as errors per port.

The product also supports out-of-band network management link capabilities for both environments. With these features, a primary network link could go down and the system could support dial-up communications with remote devices to inquire about the system's health.

Prices for the products range from $2,650 for the ODS 292 to $3,350 for the ODS 295. The ODS 295 and 296 are shipping now, and the ODS 292 is expected to ship next month.

For further information, contact ODS at 1101 E. Arapaho Road, Richardson, Texas 75081, or call (214) 234-6400.

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DIXON ON-LINE

BY DIXON DOLL

Is IBM taking the right approach to opening up SNA?

What can Systems Network Architecture users with exploding requirements for Transmission Control Protocol/Internet Protocol and the need to begin experimenting with Open Systems Interconnection do?

For several years, IBM resisted making a full-fledged TCP/IP support commitment. Ultimately, it concluded that TCP/IP environments would be with us for a long time. As a first major step in making a commitment to TCP/IP, IBM unveiled a broad array of TCP/IP products in mid-1990.

In addition, IBM is just beginning to make a commitment to providing OSI-compatible products and services across its full product range. In fact, IBM's Communications Systems group's recent move to London is, in my opinion, a specific step that IBM has taken in order to get closer to OSI-intensive users and provide a higher degree of coordination with its new European laboratories and multinational users in the OSI arena.

> In an environment that mixes SNA, OSI and TCP/IP, there are bewildering choices.
>
> ▲▲▲

Large multinational end users can expect comprehensive support for traditional host-based network applications from IBM. They will also need IBM to support increasingly sophisticated client/server-based distributed computing applications in conjunction with TCP/IP environments.

In an environment that mixes SNA, OSI and TCP/IP, there are bewildering choices and combinations for users to evaluate in building connectivity solutions. These involve mixed cabling schemes, LAN adapter cards, T-1 backbones and heterogeneous computing platforms. Users will need to decide whether they should envelop OSI and TCP/IP traffic over an SNA backbone or, perhaps alternatively, envelop SNA traffic over multiprotocol backbones.

Other issues involve evaluating trade-offs in using the above-noted schemes vs. protocol-independent bridges or protocol-dependent routers operating over independently derived subchannels on a backbone net. Testing new configurations is another big problem, since even the major vendors lack the requisite skills.

Another planning concern users face is to select specific configurations that assure end-to-end manageability. Avoid configurations that prevent net management products from controlling the net end-to-end because of obstacles potentially introduced at various LAN interconnection nodes.

The principal challenge for users will be evaluating the timing and cost-effectiveness of additional IBM product offerings in the above three areas. Many users can't wait for all these offerings to become available from IBM. These user needs have been fueling the growth of independent internetworking companies, especially those in the bridge, router and gateway business, during the past few years.

As IBM continues to open up SNA, we will continue to see clever and innovative users meeting tactical requirements of the next year or two by opting for manageable environments that emphasize simplicity instead of the more elegant solutions that compromise end-to-end manageability.

Doll is a general partner of Accel Partners, a technology investment firm based in Princeton, N.J., with offices in San Francisco. He is also chairman of the DMW Group, Inc., a telecommunications architecture and network integration consultancy headquartered in London. He can be reached by calling (415) 989-2208.

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EDITORIAL

An open letter to FCC Chairman Alfred Sikes

Dear Mr. Sikes,

As the FCC embarks on its court-ordered reexamination of AT&T's controversial custom network arrangements, we urge the commission to give this matter careful and thorough examination so that the question of Tariff 12's legality may be resolved once and for all.

A timely and legally unassailable decision on Tariff 12 is an absolute necessity for the dozens of major corporations that have invested millions of dollars in examining, designing and deploying Tariff 12 networks, as well as the many other companies contemplating custom network arrangements and awaiting clear guidance.

Certainly, corporate America has thrown its weight behind the Tariff 12 concept. This is evident from the significant outpouring of support for Tariff 12 that came during the comment cycle prior to this reinvestigation.

Two weeks ago, nearly 50 users urged your commission to once again approve Tariff 12 and allow AT&T to continue offering custom network deals.

In comments filed with the FCC, users said Tariff 12 gives them a level of service never before available from long-distance carriers.

As chairman, you have expressed your desire to give market forces, rather than regulation, a greater hand in shaping the telecommunications industry.

Tariff 12 certainly reflects a more competitive long-distance market and offers AT&T a good deal more flexibility.

But your agency is bound now to determine whether our existing legal and regulatory framework gives AT&T the latitude to offer Tariff 12 arrangements.

And you owe public network users, as well as AT&T and its competitors, an exhaustive examination of the matter and a final decision based on a sound legal foundation — and not on mere ideology alone.

If it can be shown that Tariff 12 is legal, users would be able to move forward with confidence in fulfilling their network strategies.

In addition, AT&T will be able to market custom networks without fear that rivals will play on concerns over Tariff 12's legality.

If Tariff 12 is illegal, those favoring greater market freedom for AT&T can turn their attention to changing the legal or regulatory underpinnings that today withhold that freedom.

Outdated laws and regulations stymie market growth. But uncertainty has an even more chilling effect.

We urge the commission to redouble its efforts to resolve the uncertainty surrounding Tariff 12.

OPINIONS

REGULATORY AFFAIRS

BY ALAN PEARCE

FCC threatens foreign administrators on users' behalf

Users of international telecommunications services have been angered by price gouging and profiteering by the so-called foreign administrations. Foreign administrations, generally speaking, are state-owned and controlled telecommunications entities, but they also include privatized companies such as British Telecommunications PLC and Nippon Telegraph and Telephone Corp.

According to users from most multinational firms and financial institutions, the telecommunications administrations are deliberately soaking American companies in order to cross-subsidize other activities. Because of user complaints, the Federal Communications Commission recently launched a Notice of Inquiry aimed at forcing these foreign entities to reduce their prices.

In launching the inquiry, the FCC threatened to take unilateral action if something was not done about the "above-cost international accounting rates and the disparity in international calling prices to and from the U.S." The problem, according to the commission, has resulted in an annual U.S. deficit of more than $2 billion. Perhaps as much as $1 billion of this deficit represents an overpayment by U.S. consumers and companies to foreign carriers, the FCC claims.

As might be expected, foreign carriers screamed in protest, claiming that the FCC lacks authority to take unilateral action. Nonetheless, the combination of user pressure and threatened FCC action has had some positive results. Foreign entities, including British Telecom, the German carrier Deutsche Bundespost Telekom, France Telecom and the Japanese carrier Kokusai Denshin Denwa, Ltd., have all either reduced or announced intentions to reduce their international rates.

The disparity in rates between the U.S. portion of an international call and the foreign portion is at least 20 years old. Why this action now, and why is it meeting with almost immediate success? Because of several reasons:

- Users, particularly U.S.-owned, multinational corporations and financial institutions, are much better organized today than they used to be. They are able to exert their influence, not just on the FCC, but also on foreign carriers — especially the privatized and procompetitive British Telecom.

> Telecommunications administrations are deliberately soaking American companies.
>
> ▲▲▲

- FCC Chairman Alfred Sikes listens to users. "Today, the FCC is much more responsive and receptive to our ideas," says Gary Weis, senior vice-president at Sears Technology Services, Inc. Explains a senior official of the FCC's Common Carrier Bureau, "The decision to launch this investigation came from Sikes himself."
- The spirit of competition and privatization is sweeping the rest of the world. Today, the foreign telecommunciations administrations, which at one time acted as a noncompetitive cartel, are beginning to compete with one another as European or Asian gateways. A system of arbitrage has developed, whereby low-cost countries, such as the U.K., might lower rates in an attempt to attract and collect U.S. traffic and then transfer it within Europe.
- The capacity of international facilities — more satellites and more fiber-optic cables — is increasing. This capacity has to be filled or at least partially filled. The result is a lowering of prices in hopes of boosting demand.
- The press is becoming interested in international telecommunications. Recent articles in *The Financial Times of London* and *The Wall Street Journal* have embarrassed some of the foreign entities into lowering prices. *The Financial Times,* for example, claimed British Telecom's margin on international telecommunications traffic was in the 60% range.
- Regulatory mechanisms are proliferating in other parts of the world, particularly in Europe. Telecommunications carriers in the U.K., for example, are now price-regulated by that country's Office of Telecommunications.

In most countries, regulators actually regulate, which means that they want prices to reflect costs. The costs of providing international services have been dropping, but those reductions have not been reflected in prices. Foreign regulatory bodies are insisting that users receive some of the benefits of the cost reductions brought on by new technological developments.

All of this is good news for the users. But the battle to reduce prices has only just begun. This is perhaps the first of many examples of the empowerment of users as international telecommunications traffic continues to grow rapidly. Price reductions by the foreign entities will increase that traffic and will increase revenues for the foreign telecommunications entities.

But before we celebrate, we must remember that developing areas of the world — Africa, Latin America, Eastern Europe and parts of Asia — can barely cope with the international traffic they currently are called on to handle. So it will be some time before they upgrade their facilities and reduce prices. ◘

Pearce is president of Information Age Economics, Inc., a telecommunications research firm in Washington, D.C.

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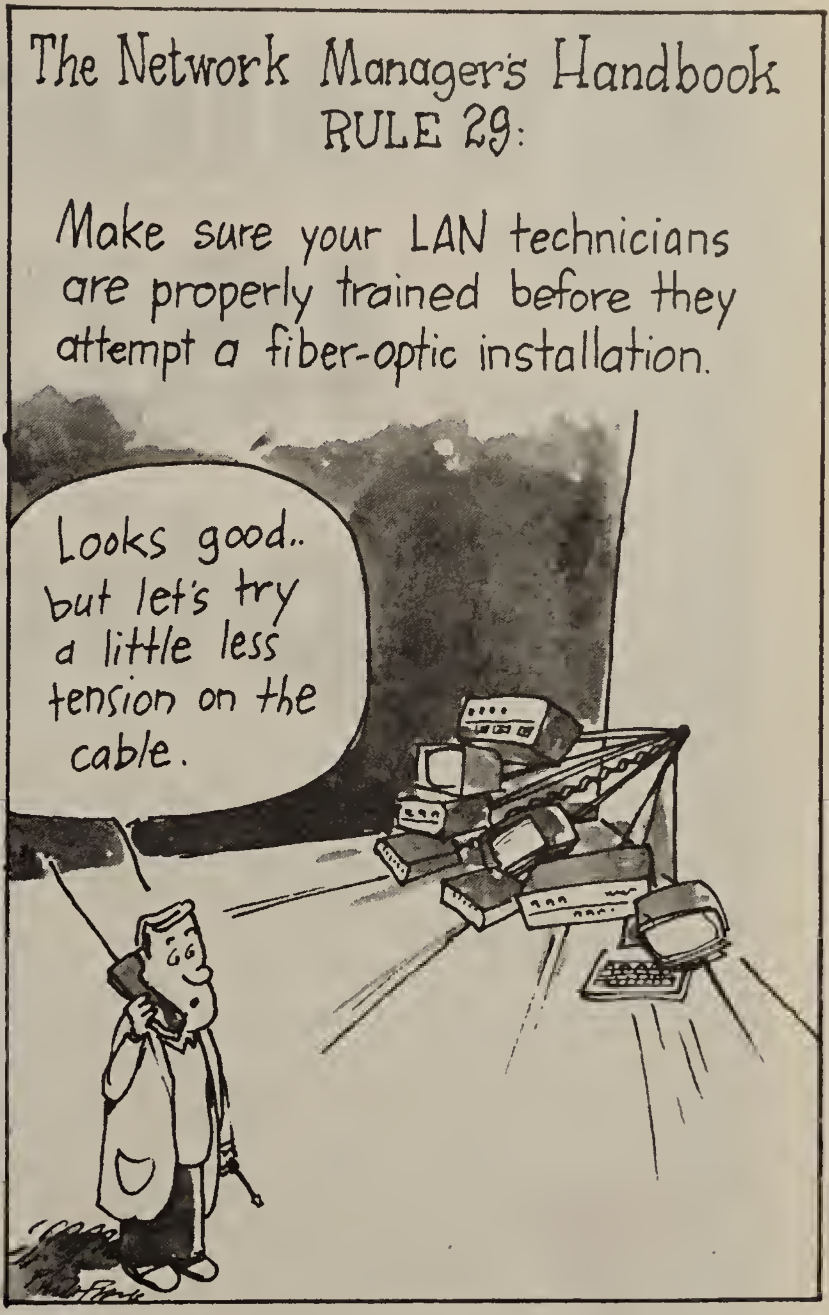
TELETOONS

BY FRANK AND TROISE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Looks good.. but let's try a little less tension on the cable.

LETTERS

Interstellar pricing

In his letter "A wolf in OSI clothing" (*NW,* Feb. 4), Eugene Shklar asserts that IBM offers "the galaxy's most outrageously expensive solution for intersystem [Open Systems Interconnection] file transfer and electronic mail exchange."

Now, astronomers estimate that our galaxy contains 100 billion solar systems. So assuming only a modest fraction of these contain planets that have life forms and, of these, a smaller number have developed technologies for intersystem OSI file transfer, I think it entirely reasonable to suggest that on one of these distant worlds a company might be offering a product that is more expensive than IBM's.

In any event, Mr. Shklar and your otherwise responsible publication are to be chastised for not verifying absolutely the accuracy of such statements before they are offered to an often naive public.

Greg Fontanini
Network analyst
Federal Reserve Bank
of San Francisco
San Francisco

Spectrum allocation

I read with interest the editorial "It's time to put cash to work in allocating frequencies" (*NW*, Feb. 11). I agree with the conclusion that the Federal Communications Commission should reject Apple Computer, Inc.'s request for 40 MHz of radio spectrum, but for different reasons.

The radio spectrum is a limited resource. True, technological developments are producing greater spectrum efficiencies. But no matter how we squeeze, there will al-

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Network World *welcomes letters from its readers.*

Letters should be typed and double-spaced. Mail them to Editor, Network World, *161 Worcester Road, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

Evaluating ISDN options

By MARY JOHNSTON-TURNER

These may be the hardest of times for backers of Integrated Services Digital Network. Critics are saying ISDN isn't likely to provide much more than a digital version of today's analog services and it's underpowered for today's data needs.

All this is misleading. ISDN is inevitable in the public network, where it is already gradually establishing itself as a cornerstone technology.

And while narrowband ISDN (defined as standard digital services operating at speeds under 2M bit/sec) will never be the answer to all of a corporation's communications requirements, it will satisfy some of them more cost-effectively than higher capacity broadband services.

Note also that for many groups of users — including small and midsize businesses, as well as the offices of many national and international corporations, and even residential users — ISDN's 64K bit/sec per-channel data rates provide a quantum improvement from today's 2,400 bit/sec modems.

Many users see clear value in ISDN. Such organizations as Eastman Kodak Co., the U.S. Air Force and McDonald's Corp. are well known for their developments using basic rate ISDN.

Eastman Kodak is participating in a statewide trial in New York to provide voice and data to smaller field offices that previously

(continued on page 45)

Johnston-Turner is a principal with Northeast Consulting Resources, Inc., a Boston-based consulting collaborative specializing in management, communications and information strategies.

The greater availability of ISDN services has users studying the technology's role in strategic network architectures.

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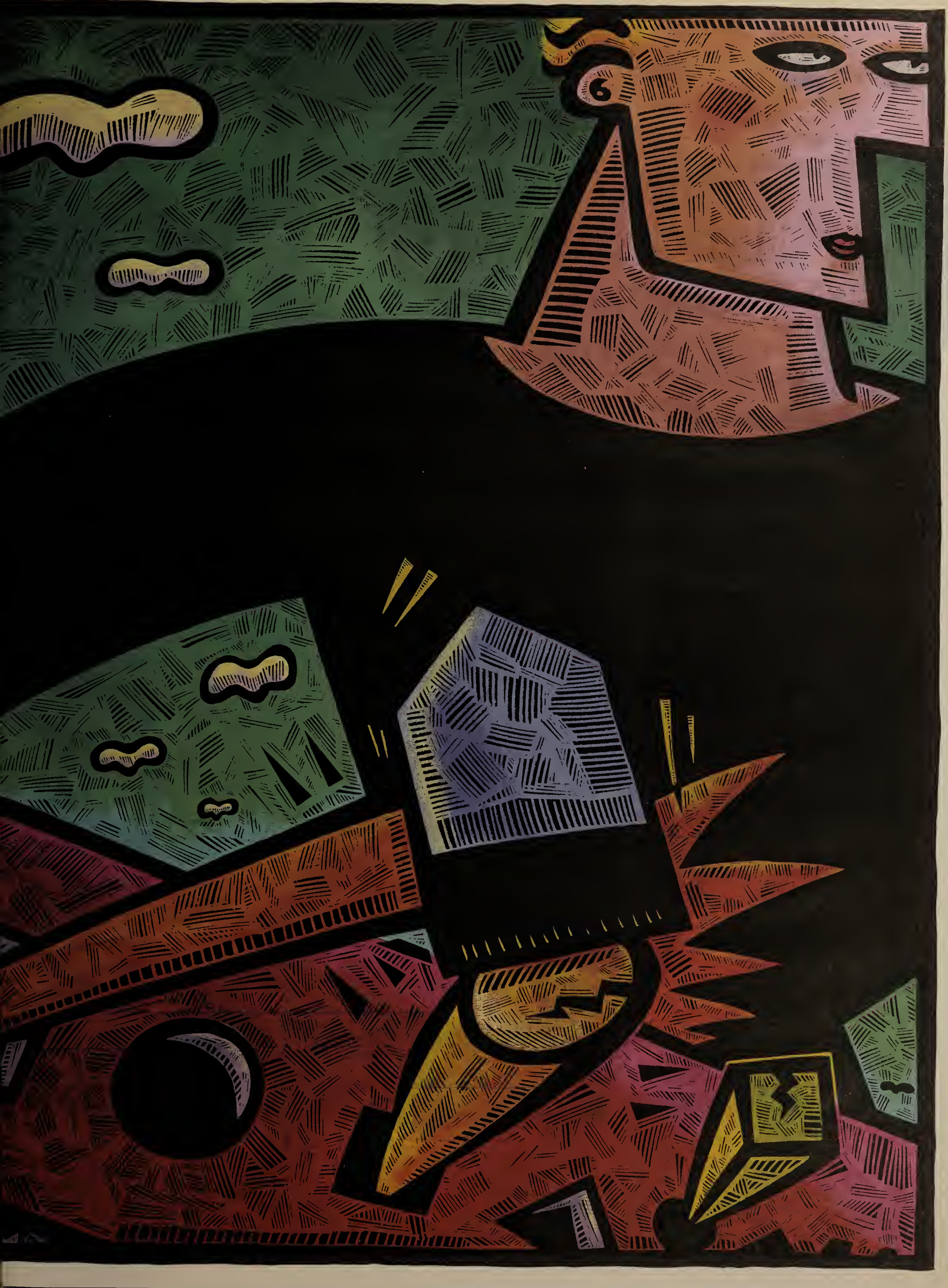

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could not afford dedicated data connections. The Air Force is cutting costs by eliminating duplicate voice and data circuits at its model technology laboratory. And McDonald's, after running a much-publicized pilot test, has announced plans to build a global ISDN.

Other organizations are testing ISDN for screen sharing, desktop video, personal telephone call management, switched local-area network interconnection, point-of-sale data transmission and telecommuting.

Primary Rate Interface (PRI) ISDN applications have also been successful. More than 60 companies have purchased PRI services to improve their telemarketing operations. Many of these firms have discovered a particular benefit of ISDN: Managing circuit assignments through ISDN's packetized signaling channel, known as the D channel, can reduce trunking requirements and significantly decrease call holding times.

Availability, affordability

While many users are starting to believe in ISDN's theoretical merits, they still wonder whether their companies can afford ISDN and whether it will become available wherever they need it.

Many users that once considered ISDN unobtainable or overly expensive may now find themselves reexamining the service.

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These two questions concerning availability and affordability have been the greatest drag on the acceptance of ISDN. In fact, for every organization committing to ISDN, dozens have probably identified worthwhile ISDN applications but have balked at large-scale deployment.

Because of ISDN's limited availability, these potential users found that only a limited number of their staff members could access the innovation. They also discovered that some of today's ISDN customer premises equipment is not transportable to other ISDN services.

Things are, however, beginning to change. Customer premises equipment prices are slowly coming down, and public carriers are gradually providing a more ubiquitous infrastructure. For example, terminal adapter prices have fallen from more than $1,000 two years ago to less than $500 today.

Several interexchange carriers now have nationwide ISDN service available. The majority of local exchange carriers have filed some type of Basic Rate Interface (BRI) tariff, and PRI tariffs are on the way (see "The way ISDN pricing is shaping up," this page).

By year end, local exchange carrier-to-interexchange carrier connections are likely to be in place, and users will be able to start planning for end-to-end ISDN services. This is a major improvement from the isolated islands created by the Centrex-based trials that began in 1986.

The ISDN triad

Improved ISDN availability and pricing decreases are expected to continue for the next several years. Thus, many user organizations that once considered ISDN unobtainable or overly expensive may now find themselves reexamining the service.

Users embarking on an examination of the fit between ISDN and their private network goals should recognize that three key parties — customer premises equipment makers, interexchange carriers and local exchange carriers — must be consulted.

Each of these groups will have focused on a different set of priorities, leaving it up to the user to fit the pieces together.

Customer premises equipment vendors, such as AT&T and Northern Telecom, Inc., have focused on circuit-switched PRI development for their private branch exchanges. But so far, none of the leading PBX vendors can support packet switching, except for D channel processing.

Vendors of desktop customer premises equipment have also weighed their development toward circuit-switched applications.

The interexchange carriers have focused on national availability of PRI services but, again, only from a circuit-switched services perspective. In terms of applications, they have worked on automatic number identification (ANI) and dynamic bandwidth management services. BRI services are not available from the interexchange carriers.

The local exchange carriers, on the other hand, initially focused on providing Centrex enhancements. More recently, though, some have introduced single-line BRI and limited PRI services.

Applications featured by the local exchange carriers include coaxial replacement, personal computer-to-personal computer file transfer and desktop video.

Where ISDN is available or planned, users are likely to find that it plays a complementary role to such other network components as private lines but it is

(continued on page 66)

The way ISDN pricing is shaping up

For many users, it's difficult right now to determine whether implementing Integrated Services Digital Network technology makes sense. One of the reasons for this is that ISDN service tariffs are not available in all parts of the country. In addition, those that are available aren't consistent.

This situation frustrates many potential users. The ISDN picture is confusing in many respects.

On the Basic Rate Interface (BRI) side of ISDN, the local exchange carriers have taken a wide range of positions. Some, such as Southwestern Bell Telephone Co., have opted to link ISDN to Centrex, giving users only limited choices in terms of feature packages.

Other regional Bell holding companies, as exemplified by Nynex Corp.'s upcoming as yet unnamed offering, will offer ISDN on a single-line basis and allow users to choose from a range of features, from call holding and call transfer to packet-switched services and closed user groups.

BRI prices also vary. Many firms offer a 1B+D solution priced at about 1.2 times that of a non-ISDN voice channel.

Typically, the B channel is used only for circuit-switched applications — mainly voice. But it can also be used to transmit data. If so used, it offers the potential of sending information at rates several times faster than those of the fastest dial-up modems.

Pricing for fully configured 2B+D channels can run as high as 2.2 times that of a single voice channel, but such a full BRI implementation naturally delivers significantly more bandwidth than a single analog circuit.

PRI arrives

Until last December, Primary Rate Interface (PRI) services were the province of the interexchange carriers, which offered it as an upgrade to T-1 circuits.

Typically, the interexchange carriers' PRI connections run $300 to $400 above the price of a T-1 link. Automatic number identification charges average 1 cent for each number identified.

Pacific Bell's PRI service, the first to be offered by a local exchange carrier, is available in 23B+D or 24B (when a second PRI's D channel provides signaling and control). It costs $545 per month.

The cost of service features range from $6 per month for use of the D channel to convey short messages during call setup or teardown to $825 per month to connect a private circuit to the PRI.

The price comparison to existing services will vary depending on the features, but as with the interexchange carriers' services, most users opting for local exchange carrier PRI will be looking to add value to their networks, rather than to reduce T-1 costs.

The above pricing information shows that ISDN services often will not save a company money when their costs are directly compared to those of equivalent-quality non-ISDN services.

However, the ISDN cost-justification process should include recognition of the improved bandwidth efficiency ISDN can provide, the reduced trunk hold times (often 5% to 15% less than non-ISDN) and the possible reductions in the number of trunks required.

Users should also factor into their calculations the reduced need for telephone agents due to ISDN's faster call handling, improved end-user productivity and the technology's ability to extend higher speed data services to new user groups.

— *Mary Johnston-Turner*

ISDN offers unexpected features, price savings

Some of the most interesting Integrated Services Digital Network applications haven't received much publicity yet. And they don't relate to the potentially controversial aspect of ISDN — automatic number identification — or to the already well-known call-by-call selection feature of the Primary Rate Interface (PRI).

For example, the University of Michigan is using the Basic Rate Interface (BRI) to provide Transmission Control Protocol/Internet Protocol services to off-campus departments and to the homes of faculty and staff. TCP/IP, of course, is a packet-switched service, and no local carriers are believed to have tariffed ISDN's packet-switching capabilities.

What's happening in this case is that the university is using ISDN's B channels to establish connectivity between the remote sites — four of which are on-line at present — and the university's campus net.

Prior to the arrival of ISDN in mid-1989, the university considered making the connections over leased 56K bit/sec digital circuits, says Dory Leifer, a systems research programmer who is in charge of the project.

The main advantage of ISDN that he lists: The university has found that the cost of ISDN usage comes to only around one-tenth of what 56K bit/sec dedicated circuits cost per month. Also, the service allows data to be sent at speeds up to 128K bit/sec and the fact that this is a switched service allows multiple users to share a port.

Some consultants have already begun to work out the savings that the higher data rates of ISDN would allow. For instance, Brij Bhushan, president of Reston Consulting Group in Reston, Va., uses a comparison with transmission through a 9.6K bit/sec dial-up modem to contrast with ISDN.

"If, for example, a transmission at 9.6K bit/sec takes 15 minutes and the telephone service costs 30 cents a minute, the user pays $4.50. Now suppose that you transmit at 64K bit/sec. Supposing that an ISDN call costs twice as much per minute as a plain old telephone service call. Still, the holding time at this data rate would only be 2½ minutes and the cost of the call would be only $1.50," he says.

Jeffrey Held, a partner at Ernst & Young's Network Strategies, a network consultancy in Vienna, Va., points out another potential ISDN application. Held says ISDN would allow users to perform overflow routing of data in the same way that private branch exchanges conduct overflow routing of voice calls.

"As router-based networks get less hierarchical and the routers get more intelligent," Held says, "they'll be able to select [the optimal transmission path] from a variety of carrier services, such as leased lines, packet-switched services, frame relay and switched ISDN."

— *Lynn Haber*

Haber is a Boston-based free-lance writer who specializes in computers and communications.

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Shopping for tariff information

CONTINUED FROM PAGE 1

rate comparison information is now available through dial-up, on-line services.

Who's who

Currently, about eight to 10 established tariff information service providers sell intra- and interstate as well as international tariff information. Because of obvious differences in the amount of detailed information they provide, these services can be divided into two tiers of providers.

The top tier provides the most information. In my view, this tier comprises four companies: The Center for Communications Management Information (CCMI) of Rockville, Md.; Telecommunications Information Services of Concordville, Pa.; Tele-Tech Services of McAfee, N.J.; and Valucom, Inc. of Vienna, Va.

These companies typically provide intra- and interstate tariffs and, in some cases, international tariff information. They also provide Federal Communications Commission filings, transmittals, releases and relevant court documents. In addition, they offer other tariff services, usually in the form of custom research services, custom consulting, network analysis,

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Briere is president of Tele-Choice, Inc., a Montclair, N.J., telecommunications consultancy specializing in long-distance service analysis and network design. He can be reached at (201) 746-0200.

A wide variety of tariff information services can help you keep track of the various elements of your net.

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Where to find firms offering tariff information

TeleResource Service
Bell Communications Research
Bellcore Customer Service
60 New England Ave.
Piscataway, N.J. 08854
(201) 699-2000

This service of the Bellcore Federal Regulatory Resource Center compiles and reviews Federal Communications Commission filings, rulings and other sources of information. Daily updates of all information are available.

The eight basic services offered are: FCC Daily Digest and Federal Register (containing information on the FCC-related Federal Register and a daily tariff log); common carrier docketed proceedings; tariff filings by all domestic tariffed carriers as well as all subsequent oppositions and replies; accounting and auditing (from FCC Accounting and Audits division, including carrier accounting plans); enforcement and policy matters (common carrier-related complaints; waivers and petitions via the Common Carrier Bureau); industry reports and letters (by FCC groups such as the Office of Plans and Policy, including letters related to common carrier issues); public mobile and domestic facilities (also includes community antenna television, private radio and international satellite); and Modified Final Judgment district court documents.

Monthly or annual subscriptions are available. There is an additional charge of 11 cents per page. Delivery by overnight courier is available, with cost of delivery charged on the customer's monthly statement. That statement shows subscription rates, number of pages received and shipping charges.

The Center for Communications Management Information
11300 Rockville Pike
Rockville, Md. 20852
(301) 816-8950

The Center for Communications Management Information (CCMI) was founded in 1972 and acquired by McGraw-Hill, Inc. in 1984. McGraw-Hill sold the firm to United Communications Group in September 1990.

Customers have access to tariff analysts and to other staff, who interpret tariffs and explain the intricacies to users. Analysts research tariffs to find out what users need to know about them. Customers can buy tariffs on a onetime basis or subscribe to quarterly or weekly updates.

With CCMI's entry-level product, called Selective Screening, users receive paper copies of tariffs. They can also obtain only sections or individual pages if needed. CCMI's Guides to Networking Services are loose-leaf paper distillations of tariffs.

The company's on-line service is software that allows users to determine rates between points. The system takes the user input, searches data bases and uses tariff information to give users point-to-point rates through the on-line connection.

In addition, CCMI offers data base services for net design, optimization and analysis. This product is typically used by end users and carriers that are selling net designs, optimization services or packages. Basic rate data base information is also available.

On the international front, CCMI offers all tariffs for U.S.-based carriers and record carriers. CCMI is also the authorized North American distributor of publications from the Eurodata Foundation.

This is paper-based information. Again, these are not tariffs, but translated distillations of actual documents. Descriptions of post, telegraph and telephone administrations' services are available, as are maps of countries, PTT information and instructions about how to get more details from the PTTs. Basic information is also available through CCMI's on-line service.

Downtown Copy Center
1114 21st St. N.W.
Washington, D.C. 20036
(202) 452-1422

In business for 16 years, the Downtown Copy Center (DCC) can provide customers with any FCC public document, including domestic and international tariffs for U.S.-based or other carriers filing with the FCC. This information is available on a subscription or per-order basis.

DCC also holds a nonexclusive FCC contract to disseminate FCC releases, tariffs and information under the Freedom of Information Act. DCC has had the latest contract since Jan. 2, 1991; prior to that, the company held the contract from April 1975 to August 1983.

DCC does not provide intrastate tariff information. The company provides rate change updates and other revisions of information. It will also track and report filings and tariffs for customers.

The frequency with which information is updated varies from tariff to tariff and carrier to carrier. In addition, DCC provides onetime tariff reports on request. Customers are charged by subscription or per-order fees, per-page charges, postage and shipping. Custom research services are available, including tariff and rate comparisons.

Fair Press Services
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P.O. Box 19352
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(202) 463-7323

Fair Press Services (FPS), which has been in business since 1969, started as a provider of custom research, a service it still offers.

FPS offers daily delivery of 43 categories and subcategories of FCC documents. Customers also receive the FPS Daily Digest, an index to FCC documents. There is no fixed subscription term; customers are billed for documents received.

FPS is a document service and does not do the type of custom research that some other tariff services perform.

The general categories of documents include: broadcast, CATV, private radio, common carrier and Part 15; releases reporting all FCC actions; and text documents including all complete, official wording.

There are subscription charges, per-page charges and delivery charges, and deposits are required for some services. Same day transmission of some documents is also available.

International Transcript Services, Inc.
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Washington, D.C. 20037
(202) 857-3800

International Transcript Services, Inc. (ITS) provides FCC document retrieval and copying services, sold as onetime purchases or through subscriptions. The company, which has been in business since 1976, also performs special research projects for customers. The tariff information provided is paper-based.

ITS maintains a staff of research analysts, with each analyst specializing in a different area of FCC operations, such as common carrier dockets, tariffs, research library, cellular, Metropolitan Data Services/microwave, mass media and private radio.

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traffic engineering or tariff analysis. Various levels of tariff information are available, from simplified rate information to complete tariffs to comparative tariff analyses. This last service, while expensive, is especially handy for those users wishing to compare tariffed services from different carriers.

Complete word-for-word versions of most tariff information are available in hard copy, typically in loose-leaf notebook format for easy updating. CCMI, Tele-Tech Services and Valucom offer consolidated versions of this basic, point-to-point rate information through dial-up, online services. These menu-driven services are most useful for users desiring only comparative rate information on point-to-point links. On-line full-text retrieval of an entire tariff is not yet available from any tariff information service provider.

Information can be subscribed to on a weekly, monthly or quarterly basis, or it can be purchased on a onetime, needs-only basis. Updates are made available as the relevant tariff changes. Some companies offer daily updates where applicable.

Pricing

As with any other service or product offered in a competitive market, prices range fairly widely between tariff services. Here are some basic guidelines:

- **Copies of individual tariffs.** Depending on the tariffed carrier service, plan on spending from $30 to $225 per tariff, regardless of which tariff service you choose.
- **Tariff updates.** Again, a standard distribution of prices prevails among the tariff services. You'll spend from 18 to 25 cents per page, plus postage, for tariff revisions or updates. The range is more dependent on the actual tariff rather than which tariff service you're using.
- **Guides.** These are the large, single or multivolume loose-leaf binders full of tariffs and explanations. For domestic, intra- or interstate, or international tariff and pricing guides, budget about $500 to $850 per year, though some tariff services may charge as much as $1,000 per year for one volume. Annual subscriptions usually include monthly or quarterly updates of each tariff included in the guide. Master guides, which typically include all intra-, interstate and international tariffs, range in cost from $2,000 to $3,500 per year, depending on the tariff service.
- **On-line services.** Currently offered by CCMI, Tele-Tech Services and Valucom, all on-line services require the user to use some sort of standard telecommunications software and modem; Valucom requires the use of Carbon Copy Plus software. They will sell it to you with your initial installation for a total of $150; installation costs $50 if you already have Carbon Copy Plus. Prices vary by monthly usage, types of transaction and time of use per call.

For example, Tele-Tech charges $50 per hour of use, while Valucom charges from 40 to 60 cents per minute, plus per-transaction charges of between $1 and $20 each. Both Valucom and CCMI have monthly minimum charges; Valucom's is $50 per month, while CCMI charges $85 per month. Tele-Tech does not charge monthly minimum fees.

- **Research services.** If you need someone who knows what they're doing to canvass the relevant tariffs and related documents and tell you what you need to know, it will cost you from $15 to $50 per hour, depending on the type of research and level of researcher knowledge you need.

Just the facts, please

Companies in the second tier of tariff information providers typically provide only paper-based copies of tariffs and perhaps some tariff research services. These firms include the American Communications Tariffs Advisory Service, Inc. in Weymouth, Mass.; Connections of Brockton, Mass.; International Transcript Services, Inc. of Washington, D.C.; Downtown Copy Center of Washington, D.C.; the TeleResource service of Bell Communications Research's Federal Regulatory Resource Center in Piscataway, N.J.; Fair Press Services in Washington, D.C.; and TEL Electronics, Inc. of American Fork, Utah.

These companies typically offer copies of FCC tariffs, releases and filings, court findings and other government documents. Some offer intrastate tariff information, but most tariff information from these companies is for interstate tariffs only. Most tariff services offer tariff information on access services, as well. These tariffs are sold on a subscription or individual basis, and updates to the tariff are made available weekly, monthly or quarterly, depending on the tariff and the tariff provider (see "Where to find firms offering tariff information," this page).

Why they use the services

In addition to the obvious uses of tariff information services — for example, to find out the price of circuits — big users are also eager to find the price of the elements of major contracts, particularly AT&T's Tariff 12 deals.

Mobil Oil Corp., one of Valucom's larger customers, uses a range of tariff information to compare actual costs with tariffed rates and to negotiate the best prices with carriers, says Matt Bauer, Valucom's manager of tariff services. He adds that

(continued on page 53)

BROADBAND ISDN

Broadband ISDN: a standards update

By WILLIAM STALLINGS

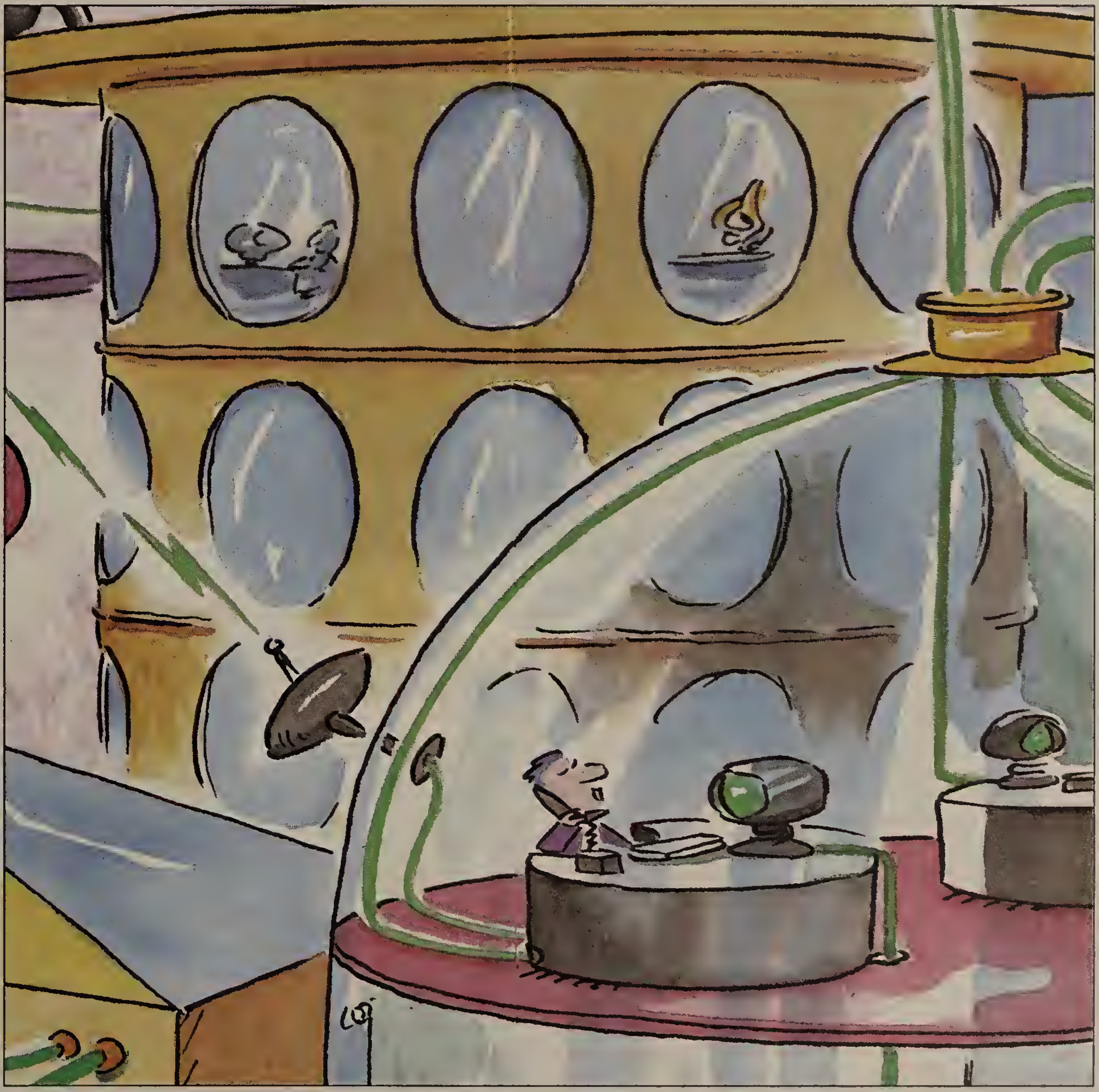
It's time to begin thinking about the next era of Integrated Services Digital Networks, the era of broadband ISDN.

The basic workings of broadband ISDN's predecessors, the Basic Rate Interface (BRI) and Primary Rate Interface (PRI) services of ISDN — called narrowband ISDN in the standards world — are now well understood by network users.

However, many users do not yet fully understand broadband ISDN, aside from a basic concept that it involves high data rates — in the hundreds of megabits per second — and its basic technology is a form of packet switching.

There is much more than this to broadband ISDN. Some of the essential details regarding how broadband ISDN would work have been clarified in recent months.

With the publication of the 1988 "blue book" recommendations from the Consultative Committee on International Telephony and Telegraphy, the bulk of the work on narrowband ISDN is complete. To be sure, future versions of the CCITT standards will provide refinements and enhancements to narrowband ISDN. But since 1988, much of the planning and design effort has been directed toward broadband ISDN, a network concept that will be far more revolutionary than ISDN itself.



The CCITT modestly defines broadband ISDN as "a service requiring transmission channels capable of supporting rates greater than the primary rate." Behind this innocuous statement are plans for a network and a set of services that are likely to have a great impact on business customers. With broadband ISDN, services requiring data rate orders beyond those that can be delivered by ISDN will become available. These include support for image processing, video, and high-capacity workstations and local-area networks.

Stallings, president of Comp-Comm Consulting in Prides Crossing, Mass., has written several books on networking technologies. His latest book is titled Data and Computer Communications, Third Edition *(MacMillan, 1991).*

The 1988 recommendations included two short documents on broadband ISDN: The first is a vocabulary of terms, and the second a brief statement of the plan for broadband ISDN. With both demand (user interest) and supply (the technology for high-speed networking) for broadband ISDN evolving rapidly, the usual four-year standards cycle would be fatal to hopes of developing a standardized high-speed network utility.

To head off the possibility of a fragmentation of effort and a proliferation of nonstandard products and services, the CCITT has issued an interim set of 1990

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draft recommendations on broadband ISDN (see Figure 1, page 52). The set of 13 documents provides for the first time a detailed, specific master plan for the broadband revolution. This article provides an overview of this master plan.

The protocol architecture

The protocol architecture for broadband ISDN introduces some new elements not found in the ISDN architecture. For broadband ISDN, the transfer of information across the user-network interface will use what is referred to as Asynchronous Transfer Mode.

Asynchronous Transfer Mode is a new

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Broadband ISDN services

The driving force behind broadband Integrated Services Digital Network is service. As such, the services that broadband ISDN will support form the set of requirements that the network must satisfy.

The Consultative Committee on International Telephony and Telegraphy classifies the services that could be provided by broadband ISDN into interactive services and distribution services.

Interactive services are those in which a two-way exchange of information — other than control signaling information — occurs between two subscribers or between a subscriber and a service provider. Distribution services are those in which the information transfer is primarily one way — from service provider to broadband ISDN subscriber.

Interactive services are further classified as conversational, messaging and retrieval. Conversational services provide for real-time dialogue between a user and an application or a user and a server. This category encompasses a wide range of applications and data types, including the transmission of video, data and documents.

An example of a conversational service requiring higher capacity than narrowband ISDN can provide is a remote image application, such as computer-aided design and manufacturing or the review and manipulation of medical images from a hospital image data base server.

Messaging services offer user-to-user communication between individual users via storage units with store-and-forward, mailbox and message handling functions.

In contrast to conversational services, messaging services do not occur in real time. Hence, they place less of a demand on the net and do not require that both users be available at the same time.

Analogous narrowband services are X.400 and teletext. One new form of messaging service that ISDN could support is video mail, similar to today's electronic mail and voice mail.

Retrieval services enable users to obtain data stored in information centers, data bases or film libraries. With this service, users could order full-length films or videos from a film/video library facility.

Of greater interest to business, educational and medical organizations, the envisioned broadband retrieval service would also allow the recovery of high-resolution images such as X-rays or CAT scans, mixed-media documents and large data files.

The broadband ISDN distribution services are classified as either with or without user presentation control. Distribution services without user presentation control are also referred to as broadcast services. They provide a continuous flow of information that is distributed from a central source to an unlimited number of authorized receivers connected to the network.

Each user can access this flow of information but has no control over it. In particular, the user cannot control the starting time or order of the presentation of the broadcast information. Users simply tap into the flow of information.

The most common example of this service is broadcast television. Currently, broadcast television is available from network broadcast via radio waves and through cable TV distribution systems.

Distribution services with user presentation control also disseminate information from a central source to a large number of users. However, the information is provided as a sequence of information entities, called frames, with cyclical repetition.

Therefore, users can have individual access to the cyclical distributed information and can control the start and order of the presentation. Because of the cyclical repetition, the user-selected information entities will always be presented from the beginning.

— *William Stallings*

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form of packet transmission across the user-network interface. It is similar to, but much faster than, X.25 — which is also a standard form of packet transmission across the user-network interface.

But there are significant differences between the two. For example, X.25 includes control signaling on the same channel as data transfer, whereas Asynchronous Transfer Mode uses common-channel signaling. Another difference is that X.25 packets may be of varying length whereas Asynchronous Transfer Mode packets are of fixed size — 53 eight-bit bytes long, to be precise. These fixed-size packets are also referred to as cells.

Two layers of the broadband ISDN protocol architecture relate to Asynchronous Transfer Mode functions: an Asynchronous Transfer Mode layer, common to all services that provide packet transfer capabilities, and an Asynchronous Transfer Mode adaptation layer (AAL) that is service-dependent (see Figure 1, page 52).

The AAL maps higher layer information into Asynchronous Transfer Mode cells for transport over broadband ISDN and then collects information from those cells for delivery to higher layers.

The 1988 I.121 recommendation contains the protocol reference model depicted in Figure 1 but provides virtually no detail on the functions to be performed at each layer. The 1990 documents include a more detailed description of functions to be performed, as illustrated in Figure 1.

The adaptation layer

The use of Asynchronous Transfer Mode creates the need for an adaptation layer to support information transfer protocols not based on it. Two examples listed in the 1988 recommendation are pulse code modulation (PCM) voice and the standard data link control protocol for ISDN, Link Access Protocol-D (LAP D).

PCM voice is an application that produces a stream of bits from a voice signal. To use this application over Asynchronous Transfer Mode, it is necessary to assemble PCM bits into cells for transmission and to read them out on reception in a way that produces a smooth, constant flow of bits to the receiver.

To carry LAP D signaling across the network, it is necessary to map LAP D frames into Asynchronous Transfer Mode cells. This procedure will probably involve segmenting one LAP D frame into a number of cells on transmission and reassembling the frame from cells on reception. By allowing the use of LAP D over Asynchronous Transfer Mode, all of the existing ISDN applications and control signaling protocols can be used on broadband ISDN.

The 1988 recommendations briefly mention AAL and point out its functions of mapping information into cells and performing segmentation and reassembly. The 1990 documents provide greater detail of the functions and services of this layer. In the area of services, four classes are defined (see Figure 3, page 52). The classification is based on whether a timing relationship must be maintained between source and destination, whether the application requires a constant bit rate and whether the transfer is connection-oriented.

An example of a Class A service is circuit emulation. In this case, a constant bit rate — which requires the maintenance of a timing relation — is used and the transfer is connection-oriented.

An example of a Class B service is variable bit-rate video, which might be used in a teleconference. Here, the application is connection-oriented and timing is important, but the bit rate varies depending on the amount of activity in the scene.

Classes C and D correspond to data transfer applications. In both cases, the bit rate may vary and no particular timing relationship is required; differences in data rate are handled by the end systems using buffers. The data transfer may be either connection-oriented (Class C) or connectionless (Class D).

To support these various classes of service, a set of protocols at the AAL level are defined. In the 1990 recommendations, a preliminary definition is provided, which is primarily functional. However, the documents do include some detail concerning header formats and procedures. The details of the AAL protocols remain to be worked out.

How it works

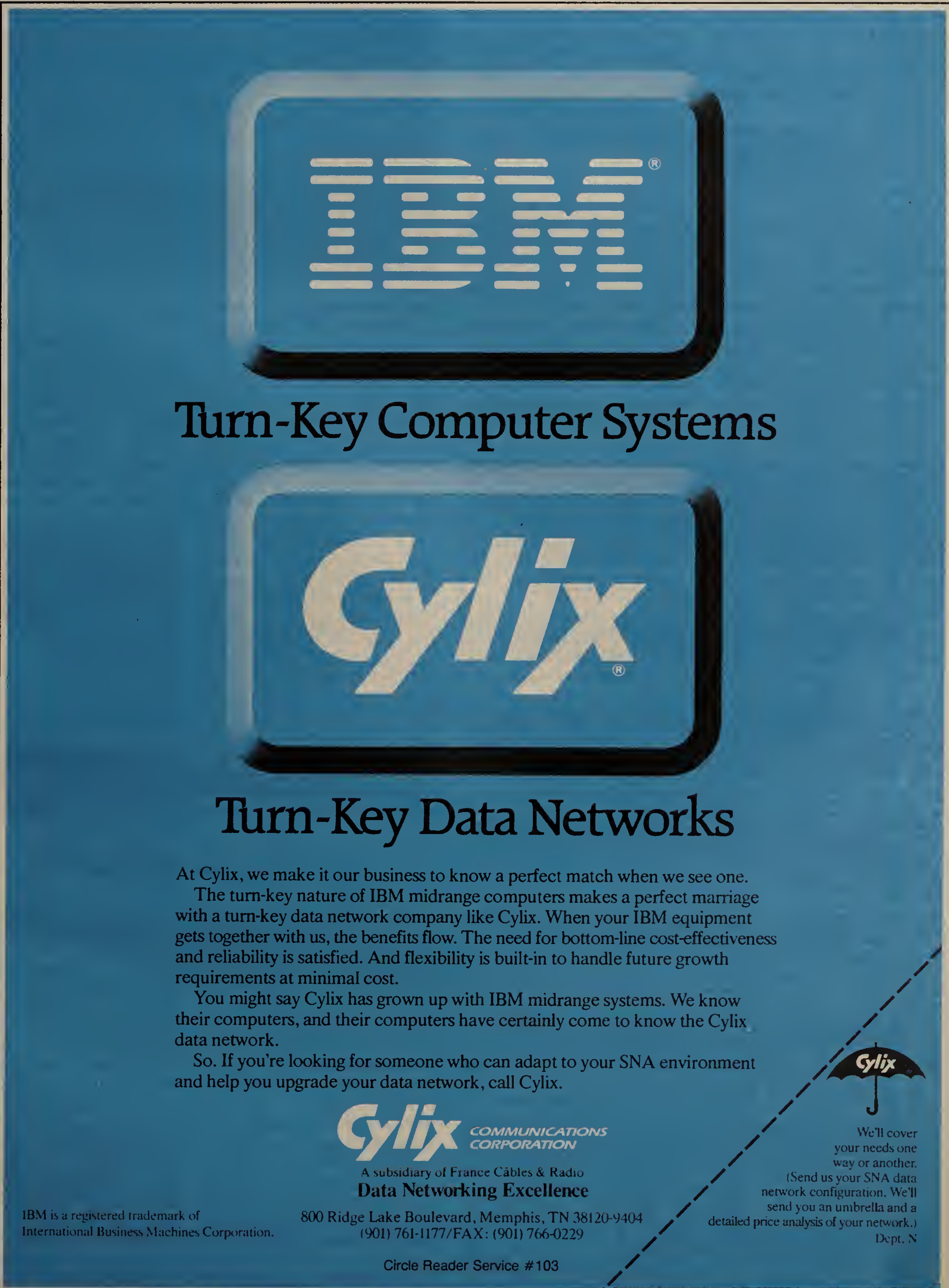
As noted, broadband ISDN will use Asynchronous Transfer Mode, making it a packet-based network at the user interface and almost certainly packet-based in terms of its internal switching.

But although the basic nature of broadband ISDN is packet-switching, the recommendation also states that it will support circuit-mode applications. Thus, ISDN, which began as an evolution from the circuit-switching telephone networks, will transform itself into a packet-switching network as it takes on broadband services.

Asynchronous Transfer Mode is similar in concept to frame relay, which is a packet interface technique planned for use in narrowband ISDN and is available today in some products that transmit over dedicated T-1 circuits.

Both Asynchronous Transfer Mode and frame relay use a streamlined set of functions to provide maximum throughput, taking advantage of the reliability and fidelity of modern digital networks to provide high-speed packet-switching by avoiding repeated error checking and other protocol functions. Asynchronous Transfer Mode takes this streamlining process

(continued on page 52)



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(continued from page 51)

much further than frame relay to be able to exploit transmission channels in the tens and hundreds of megabits per second.

In Asynchronous Transfer Mode, transmission capacity is assigned to a connection based on subscriber requirements and available capacity. Data transfer is connection-oriented, using the concepts similar to the virtual circuit in X.25.

Asynchronous Transfer Mode uses two connection concepts: virtual channel and virtual path. A virtual channel, much like an X.25 virtual circuit, provides a logical packet connection between two users. A virtual path defines a route from source to destination through a network. Multiple virtual channels may be bundled together to use the same virtual path.

The use of two connection concepts has certain advantages. For one thing, much of the work of setting up connections is done when a virtual path is first established. The addition of a new virtual channel to an existing virtual path requires little overhead. Also, a number of data transport functions, such as flow control, can be done at the virtual-path level, simplifying the network architecture.

Each Asynchronous Transfer Mode cell consists of a 5-octet header and a 48-octet information field. The header at the user-network interface includes the following fields:

- **Generic flow control.** This field is to be used for end-to-end flow control between Asynchronous Transfer Mode users. Its specific use is not defined but is left for further study.
- **Virtual path identifier.** Identifies the path or route between source and destination.
- **Virtual channel identifier.** Defines a logical connection between two Asynchronous Transfer Mode users.
- **Payload type.** Type 00 is for user information; that is, for information from the next higher layer. Other values are not defined but are left for further study. Presumably, network management and maintenance values will be assigned.
- **Cell loss priority.** A value of 1 means that this cell is subject to discard, whereas a value of 0 indicates a higher priority application for which discard is inappropriate. Discard might occur in the case of high network congestion.
- **Header error control.** This is an eight-bit error code that can be used to correct single-bit errors in the header and to detect double-bit errors.

All of the details just described are new to the 1990 draft recommendations. In the 1988 documents, the header fields and header size were undefined and it had not yet been decided to use fixed-size cells.

1990 CCITT draft recommendations on broadband ISDN
Figure 2

Number	Title	Description
I.113	Vocabulary of Terms for Broadband Aspects of ISDN	Defines terms considered essential for understanding and applying broadband ISDN principles.
I.121	Broadband Aspects of ISDN	States the basic principles of broadband ISDN and indicates how ISDN must evolve to support advanced services and applications.
I.150	B-ISDN ATM Functional Characteristics	Summarizes the functions of the Asynchronous Transfer Mode layer.
I.211	B-ISDN Service Aspects	Serves as a guideline for evolving recommendations. Includes a classification of broadband ISDN services and a consideration of necessary network aspects.
I.311	B-ISDN General Network Aspects	Describes networking techniques, signaling principles, traffic control and resources management for broadband ISDN. Introduces concepts of transmission path, virtual path and virtual channel.
I.321	B-ISDN Protocol Reference Model and its Application	Describes additions to the ISDN protocol reference model needed to accommodate broadband ISDN services and functions.
I.327	B-ISDN Functional Architecture	Describes additions to the ISDN functional architecture needed to accommodate broadband ISDN services and functions.
I.361	B-ISDN ATM Layer Specification	Describes the Asynchronous Transfer Mode layer, including cell structure, cell coding and Asynchronous Transfer Mode protocol.
I.362	B-ISDN AAL Functional Description	Provides a service classification for AAL and indicates the relationship between AAL services and AAL protocols.
I.363	B-ISDN AAL Specification	Describes the interactions between the AAL and the next higher layer; the AAL and the Asynchronous Transfer Mode layer; and AAL peer-to-peer operations.
I.413	B-ISDN User-Network Interface	Gives the reference configuration for the broadband ISDN user-network interface and examples of physical realizations.
I.432	B-ISDN User-Network Interface Physical Layer Specification	Defines physical-layer interface for broadband ISDN. Includes physical medium specification, timing and framing aspects, and header error control.
I.610	OAM Principles of B-ISDN Access	Describes the minimum functions required to maintain the physical layer and the Asynchronous Transfer Mode layer of the user access.

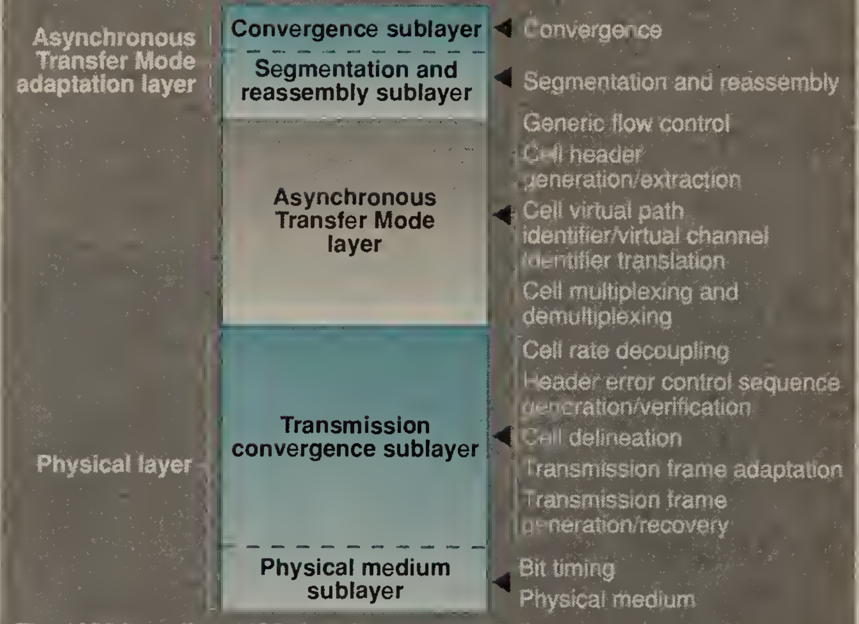
AAL = Asynchronous Transfer Mode adaptation layer
OAM = Operations, Administration and Maintenance

GRAPHIC BY SUSAN SLATER SOURCE: COMP-COMM CONSULTING, PRIDES CROSSING, MASS.

The physical layer of broadband ISDN covers the details of data rates to be supported, the nature of the physical medium and the multiplex structure for transmitting cells.

In terms of data rates available to broadband ISDN subscribers, three new transmission services are defined. The first of these has been discussed in a number of articles. It consists of a full-duplex 155.52M bit/sec service. This is by no means all that broadband ISDN would provide, however. The second service defined is asymmetrical, providing transmission from the subscriber to the network at 155.52M bit/sec and in the reverse direction at 622.08M bit/sec. The highest capacity service yet defined is a full-duplex 622.08M bit/sec service.

Protocol reference model layers and functions
Figure 1


Asynchronous Transfer Mode adaptation layer
Physical layer
Convergence sublayer
Segmentation and reassembly sublayer
Asynchronous Transfer Mode layer
Transmission convergence sublayer
Physical medium sublayer
Convergence
Segmentation and reassembly
Generic flow control
Cell header generation/extraction
Cell virtual path identifier/virtual channel identifier translation
Cell multiplexing and demultiplexing
Cell rate decoupling
Header error control sequence generation/verification
Cell delineation
Transmission frame adaptation
Transmission frame generation/recovery
Bit timing
Physical medium

The 1990 broadband ISDN draft recommendations describe the functions to be performed at each layer of the broadband ISDN protocol reference model.

GRAPHIC BY SUSAN SLATER SOURCE: COMP-COMM CONSULTING, PRIDES CROSSING, MASS.

A data rate of 155.52M bit/sec can certainly support all of the narrowband ISDN services. That is, it readily supports one or more BRIs or PRIs. In addition, it can support most of the broadband ISDN services. At that rate, one or several video channels can be supported, depending on the video resolution and the coding technique used. Thus, the full-duplex 155.52M bit/sec service will probably be the most common broadband ISDN service.

The higher data rate of 622.08M bit/sec is needed to handle multiple video distribution, such as might be required when a business conducts multiple simultaneous videoconferences. This data rate makes sense in the network-to-subscriber direction. The typical subscriber will not initiate distribution services and, thus, would still be able to use the lower service, 155.52M bit/sec.

The 1988 documents discussed the need for a 150M bit/sec and 600M bit/sec data rate service. The specific rates chosen for the 1990 documents were designed to be compatible with defined digital transmission services.

The 1988 documents also included a list of specific channel data rates to be supported within these services.

The 1990 documents drop all reference to channel rates. This allows the user and the network to negotiate any channel capacity that can fit in the available capacity provided by the network. Thus, broadband ISDN becomes much more flexible and can be tailored precisely to a wide variety of applications.

The 1988 documents do not address the issue of the physical medium on the subscriber's premises. In contrast, the latest documents provide preliminary specifications of the medium for the interface between the user and broadband ISDN.

AAL service classes
Figure 3

	Class A	Class B	Class C	Class D
Timing relation between source and destination	Required	Required	Not required	Not required
Bit rate	Constant	Variable	Variable	Variable
Connection mode	Connection-oriented	Connection-oriented	Connection-oriented	Connectionless

The 1990 broadband ISDN draft recommendations define 4 classes of AAL services. A set of AAL protocols is currently being defined to support these classes.

AAL = Asynchronous Transfer Mode adaptation layer

GRAPHIC BY SUSAN SLATER SOURCE: COMP-COMM CONSULTING, PRIDES CROSSING, MASS

For the full-duplex 155.52M bit/sec service, either coaxial cable or optical fiber may be used. The coaxial cable is to support connections up to a maximum distance of 100 to 200 meters, using one cable for transmission in each direction. The parameters defined in the 1988 Recommendation G.703 are to be used.

Optical fiber can be used to support connections as long as 800 to 2,000 meters. The details of the optical media (for example, single mode versus multimode, single full-duplex fiber versus dual fiber) have been postponed for further study.

For a service that includes the 622.08M bit/sec rate in one or both directions, optical fiber is to be used. Again, the details of the fiber parameters are left for further study.

A final important issue at the physical layer is the transmission structure to be used to multiplex cells from various virtual channels. The 1988 documents discussed this issue in general terms and proposed three alternatives. For the 155.52M bit/sec data rate, the 1990 documents reduce the number of options to two and provide more detail. For the 622.08M bit/sec data rate, the multiplex structure is left for further study.

The first of the two options for the 155.52M bit/sec data rate is the use of a continuous stream of cells, with no multiplexed frame structure imposed at the interface. Synchronization is on a cell-by-cell basis. That is, the receiver is responsible for assuring that cells are properly delineated on the 53-octet cell boundaries.

This task is accomplished by using the header error-control field. As long as the header error-control calculation indicates no errors, it is assumed that cell alignment is being properly maintained. An occasional error does not change this assumption. However, a string of error detections would indicate that the receiver is out of alignment, at which point it performs a hunting procedure to recover alignment.

The second option is to place the cells in a synchronous time-division multiplexed envelope. In this case, the bit stream at the interface has an external frame based on the Synchronous Digital Hierarchy (SDH) defined in Recommendation G.709. In the U.S., this frame structure is referred to as Synchronous Optical Network (SONET). The SDH frame may be used exclusively for Asynchronous Transfer Mode cells or may also carry other bit streams not yet defined in broadband ISDN.

Although many issues remain to be resolved, the network architecture and supported services for broadband ISDN are beginning to solidify with the publication of the 1990 draft recommendations for broadband ISDN. Sufficient detail now exists for both providers and users to plan for the arrival of this exciting new network facility.

Where to find tariff info firms

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Tariff and rate comparisons are available through ITS' custom research services.

Lynx Technologies, Inc.
P.O. Box 368
Little Falls, N.J. 07424
(201) 256-7200

Lynx Technologies, Inc. provides clients with a range of in-depth tariff information, including tariffs between the U.S. and other countries, within foreign countries, and from country to country overseas.

For the past 16 years, Lynx has published an eight-volume, 6,000-page *World Telecom Service Directory* with information on national and international tariffs for 330 carriers in 197 countries.

Lynx also maintains a large data base with international tariff information. This information is utilized by user firms, carriers and network designers/consultants. Among Lynx's clients are AT&T, U.S. Sprint Communications Co. and other major domestic and international carriers, as well as other tariff information providers.

Telecommunications Information Services, Inc.
9 La Crue St.
Concordville, Pa. 19331
(215) 558-1770

Telecommunications Information Services, Inc. (TIS) is an outgrowth of United Technologies Corp.'s Telecom MIS division. When United Technologies sold its tariff information service to CCMI/McGraw-Hill in 1986, TIS was formed by Bill Goddard and Roger Stillman, former United Technologies Telecom MIS information services director and vice-president, respectively.

In addition to providing tariff information to customers, TIS provides custom research and analysis of tariffs. The company receives daily updated tariff information, which is shipped to customers weekly. Revisions of tariff subsections or digests are shipped biweekly.

Tariff information is paper-based, in loose-leaf format. On-line information is not available. Custom research services, including tariff and rate comparisons for point-to-point links, are also available.

In addition to intra- and interstate tariffs, TIS provides analysis of rates, tariffs and trends for customers. Services are available on a onetime basis or through monthly or annual subscriptions. Customers are charged by the page and billed monthly. Annual subscribers are charged a lower per-page rate. Shipping charges are billed with the regular monthly invoices.

Fax transmission is available for an extra charge.

Tele-Tech Services
A division of
Telecommunication Systems Technology, Inc.
P.O. Box 757
McAfee, N.J. 07428
(201) 827-4421

In business for 18 years, Tele-Tech Services specializes in the provision of tariff information. As with CCMI and TIS, Tele-Tech provides virtually all intra- and interstate tariffs. The company, which maintains its own tariff library and data base, provides on-line services as well as paper-based information. Entire tariffs are available, as are subsections of tariffs and distillations or digested versions.

Information is available on a onetime purchase or subscription basis. Weekly updates are also available. Custom research services, including tariff and rate comparisons for point-to-point links, are available as well.

Tele-Tech does not charge customers for first-class postage or ground delivery through United Parcel Service, Inc.; air shipment is available at air carrier-billed rates. Daily shipment of tariff revisions is available. Revisions are billed per page; annual subscribers get a lower rate for that service.

Valucom, Inc.
501 Church St. N.E.
Suite 303
Vienna, Va. 22180
(703) 255-0700

Valucom, Inc. has been in business since 1983. According to company management, Valucom provides tariff information, custom research and analysis, as well as on-line data base and tariff services. The company also publishes a newsletter.

Valucom provides tariff information on a per-order or subscription basis. International information is available for Europe, the Middle East, the Pacific Rim and South America.

Most of the information is paper based, either in loose-leaf format or in reports. On-line services and tariff library research services are also available. Tariffs are updated weekly, while on-line data bases are updated monthly. Custom research and analysis information, including rate and tariff comparisons for point-to-point links, are provided as well.

Valucom publishes five guides for intra- and interstate rate and tariff information users: the Competitive Long Distance Rate and Optimization Guide, Competitive Intra-State Guide, Competitive Internationl Rate Guide, Interstate Switched and Special Access Guide and Canadian Services Guide. These guides are updated monthly or can be purchased on a onetime basis.

Valucom also offers a line of pricing and optimization software for user companies and service providers.

— *Daniel Briere*

Shopping for tariff info

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large users frequently use tariff information to negotiate long-term agreements with carriers.

"They're especially using Tariff 12 information," Bauer says. "Users are looking at the types of deals made with AT&T and using these as benchmarks to compare deals that other users got with their own carriers."

Another use for major tariff information grows out of the corporate merger mania of the 1980s. Many user firms, caught up in the complexity of mergers, need to know in more detail what's going on with their telecommunications costs. They need to know what they're paying for and what they can do if they acquire another firm or are themselves acquired.

For example, if a user company signs a three-year T-3 network deal with a carrier and the deal was negotiated on an individual case basis, what happens if the user is acquired by another company or if it acquires another company? What does the tariff say about which rates are applicable or even legal?

"There can be significant dollar penalties or significant dollar benefits, depending on the situation." Bauer says. "The only place to find the answers is in the tariff."

What's hot, what's not

Users are becoming increasingly interested in using tariff service providers to find out details about international rates and tariffs. "Anybody in telecom who wants to be progressive is looking across the waters on both sides," Bauer says.

CCMI, Valucom, Downtown Copy Center and others offer tariff information for any tariffed U.S.-based carrier or U.S.-based record carrier transmitting overseas, as well as for foreign carriers required to file tariffs with the FCC. In addition, they offer software that provides a network pricing capability for 35 to 40 countries, including intra- and intercountry voice and high-capacity private lines.

A major beneficiary of the international boom is Lynx Technologies, Inc. of Little Falls, N.J. Lynx publishes an eight-volume, 6,000-page *World Telecom Service Directory* with information on national and international tariffs for 330 carriers in 197 countries. Lynx President Len Elfenbein claims that some tariff information services may offer only basic rates, without providing time-of-day or day-of-week rate difference information.

Another large international tariff provider is the Eurodata Foundation, a consortium of 17 Western European post, telegraph and telephone administrations. Eurodata publishes information on tariffs between the U.S. and each of the participating PTTs, as well as tariffs within each PTT and between countries. Currently, CCMI is the authorized North American distributor of Eurodata publications.

The challenge here for users is maintaining current information on these tariffs. Many companies have had a hard time keeping up with tariffs domestically, but internationally, it is an even worse nightmare. With the services of companies such as CCMI, users can off-load the responsibility of compiling information on tariffs and pay for it in one currency.

On-line services

As noted earlier, some basic rate information is available through dial-up, on-line services. Currently, CCMI, Tele-Tech Services and Valucom offer some type of on-line rate comparison service.

The rate information provided on-line is typically only the most basic, providing point-to-point information for the various services. Complete tariffs are not available due to the complexity and size of these documents. In addition, no international rate information is currently available through on-line services. Users generally employ on-line services for comparison shopping.

Most on-line services allow their users to work out point-to-point rates for the switched and leased-line services but "these are not really tariffs," explains CCMI's David. "The software takes the user information, searches data bases and gives back rate information." Valucom's and Tele-Tech's international on-line services are similar to these services.

One well-known tariff service that does not offer on-line capabilities, and doesn't plan to, is Telecommunications Information Services, Inc. (TIS) of Concordville, Pa.

According to Bill Goddard, cofounder of TIS, his company believes that the on-line services have too restrictive a structure and that they limit the availability of the information. For deals that truly live or die by the wording of a tariff, the on-line versions are not sufficient.

CDROM in your future?

Goddard and others would love to make tariff information available to users in CDROM format. CDROM is well-suited for large, potentially cumbersome documents and data bases, a description that fits tariff information perfectly.

Unfortunately for users, CDROM won't likely be available for sometime yet. "The technology is almost here for CDROM, but not quite," Goddard says.

Typically, optical scanners, which are necessary to read the documents into the computer, are impractical due to limited capabilities in reading various type faces and characters; they are also typically slow in processing information. Large documents have not been scanned onto disk or other media due to these constraints. Although prices for scanners are dropping and the technology capabilities are increasing, the needed combination of technology and low price is not here yet.

Also, for several years now, the FCC has discussed the notion of electronic filing of tariffs to make its job easier, but it has not implemented the idea.

This may soon change, however. The FCC recently requested a budget allotment of $133.4 million for fiscal 1992, up 15% from the fiscal 1991 budget. FCC Chairman Alfred Sikes defended this budget request to Congress, claiming that part of the additional funding was necessary to upgrade the FCC's computer systems and make electronic filing possible.

Any CDROM-based tariff service would need very strong indexing capabilities and high-speed data base searching. In addition, it would have to be easy to use. Relational data base or hypercard-like capabilities would help for cross-referencing.

Industry analysts expect CDROM to really pick up in the next two years. When that happens, the impact on tariff information is likely to be nearly instantaneous. "The staff cost involved in keeping paper tariffs current is enormous," says Ann Bookbinder-Custodio, manager of on-line services for the Aries Group/MPSG, a Rockville, Md.-based consulting firm specializing in tariff issues. "Everyone will find it easy to cost-justify CDROM for tariffs when it becomes generally available."

Shopping around

Users shopping for a tariff information service must know not only which services are available, but they also must be able to explicitly identify their needs and the task they are trying to complete. Are you looking to optimize an existing network or design a new one? Or are you simply shopping around for the best long-distance deal?

Users seeking basic rate information would probably be better off taking advantage of the on-line services. The user who knows exactly what to look for and who can use on-line services competently should find that it is less expensive on a onetime basis to use the on-line service.

The expense incurred depends on the type of information the user is seeking, the service providers' on-line charges, the amount of time it takes the user to find the information and even whether or not the on-line service has the needed information.

Many tariff service customers

(continued on page 54)

(continued from page 53)

are looking for more in-depth tariff information, which is something that can best be found in the tariff pages themselves. They, therefore, often prefer that the information contain some level of analysis as well.

Users must search for the best combination of tariff information and customer service. Each provider offers different types and levels of information.

Before selecting one, ask yourself:

- Do you need in-depth tariff information and analysis, or are you merely looking for basic point-to-point rate information? If the latter, one of the on-line services may be your best bet.
- Do you want the entire text of tariffs, or can you make better use of summaries and rate information? Both of these services are available through all of the firms mentioned here and in the listing beginning on page 48. Service tariffs and digests are best suited to users with on-staff tariff analysts or network designers familiar with reading and analyzing tariffs.
- Are your needs complex? If so, look for the service providers with on-staff analysts who can help you determine what information you need, where that information can be found and how you can then use that information to your best advantage.

It's best for users that want to buy paper copies of tariffs to make a list of the tariffs needed and send it to the available tariff providers. Some providers have package deals; it may be less expensive to buy a package of standard interexchange carrier tariffs than to buy that same group minus a particular tariff.

Check references

Above all, when searching for a tariff service provider, ask for references. Most companies using tariff provision services have some horror story to tell.

For example, one firm interviewed for this story related a consistent problem. Its provider occasionally misses a transmittal and does not send it to the user. For the past several months, the user has had to verify the tariff cover pages with each page of each tariff to ensure that the tariff is current. This process takes hours and has led the customer to look for another tariff provider.

Another problem is that some providers take longer to react to filings than others. For customers that need to react quickly to tariff filings, it is critical to get the information as soon as possible. This is also a critical issue for online services. How soon after a tariff is filed is that information available through the dial-up system?

When negotiating with tariff information providers, users should stress the service they want to receive, examine the timeliness of the information and make sure the information is useful and the provider can deliver it as promised.

Reliability is crucial and far more important than price. Ask for at least 10 references and check them thoroughly.

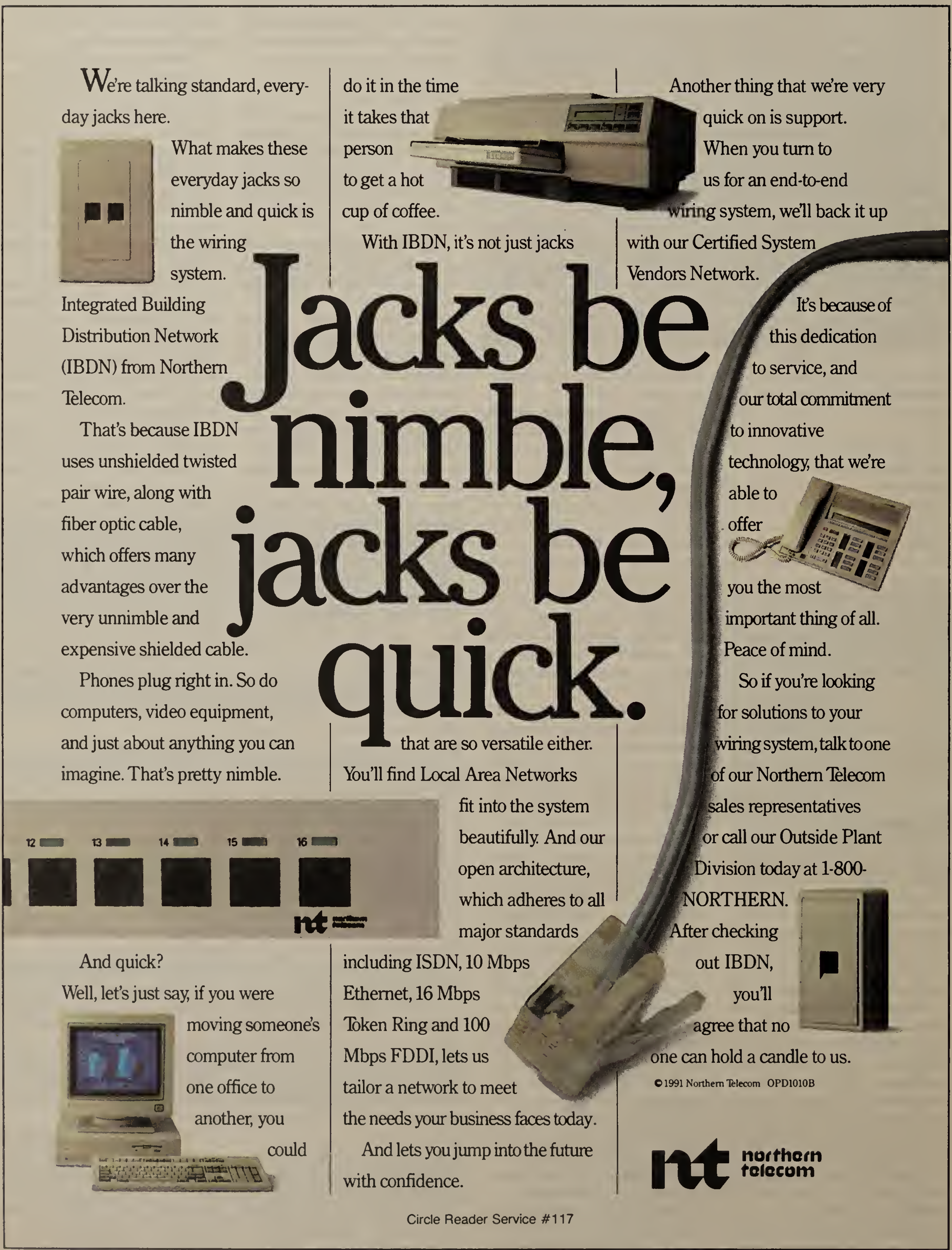
"Don't [choose a provider] on price alone," TIS' Goddard advises. "Look for service and support." With tariffs, it's performance rather than cost that counts.

Gauging the value of tariffs

Tariff information is only a gauge of the pricing of carriers. Custom tariff bids and off-tariff pricing are making it hard for users to predict price/performance based on tariffed rates ("Off-tariff prices, custom nets throw off net designs," *NW*, Jan. 14).

The FCC does not require most carriers other than AT&T to file rates. Popular carriers such as Williams Telecommunications Group, Inc. do not file tariffs, which makes it difficult to track them as an option in network planning. This is also true with all of the alternative access carriers. Carriers that don't file tariffs at the FCC or state commissions can't be reflected in any data bases of the tariff providers discussed here.

This brings up the question of the future of tariffs in a pro-deregulation atmosphere. Ten years from now, we may find that tariffs as we know them have ceased to exist. ☐



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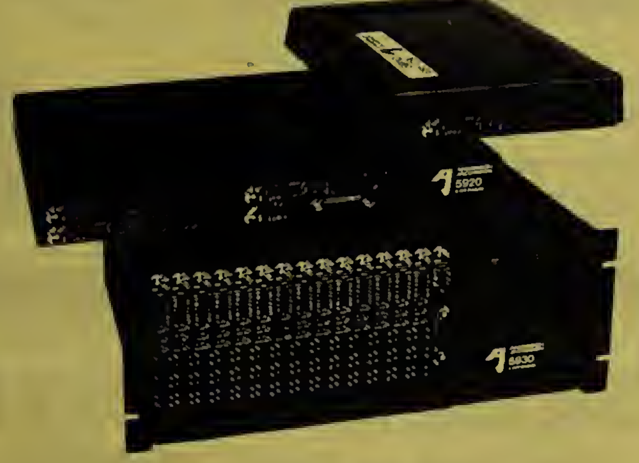

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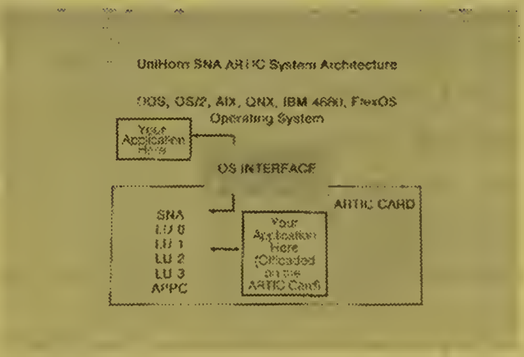
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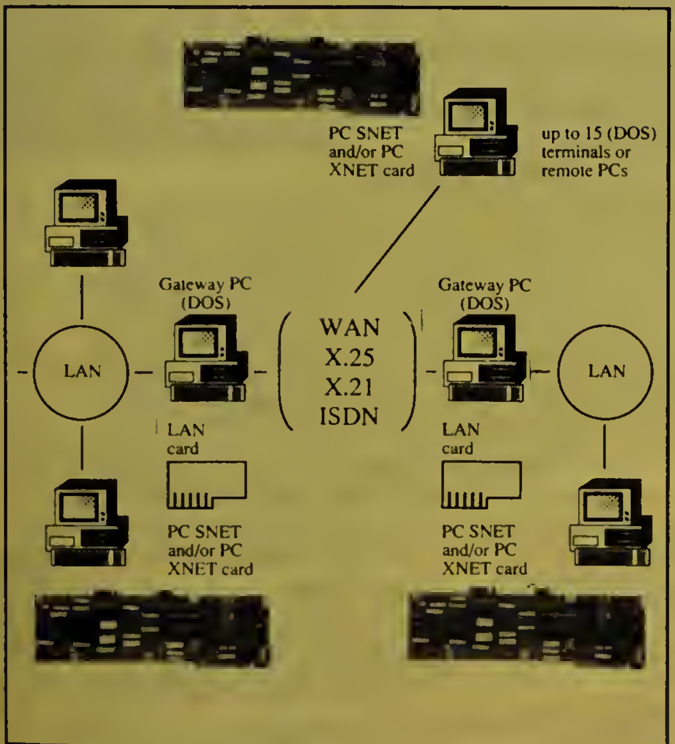
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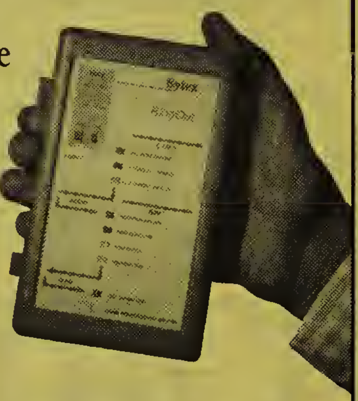

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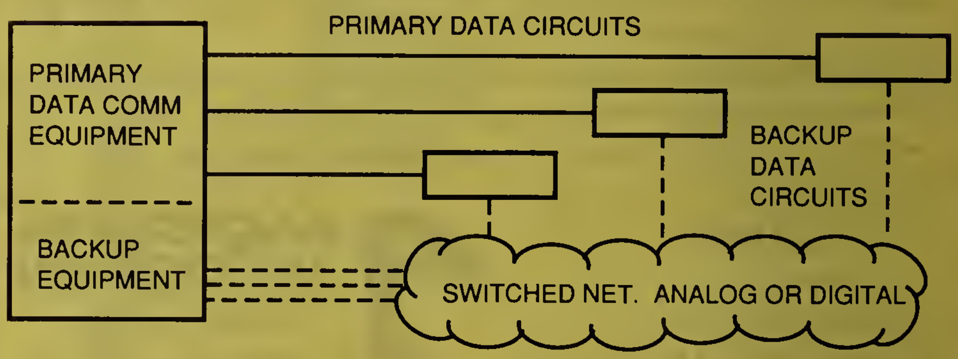

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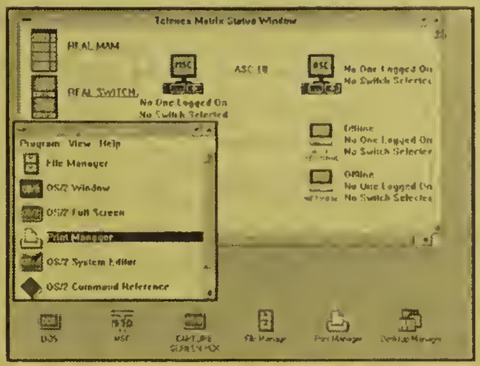

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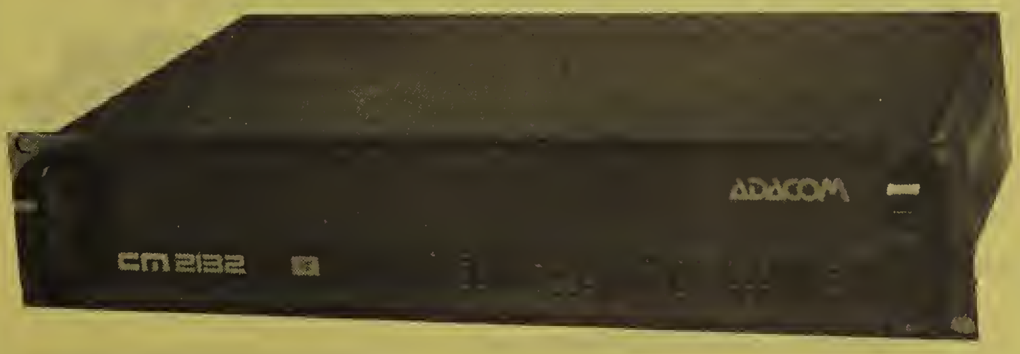

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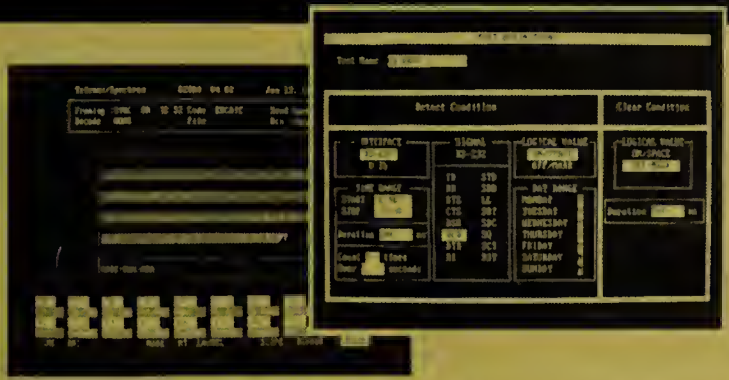

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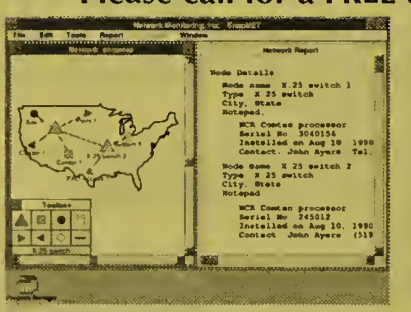

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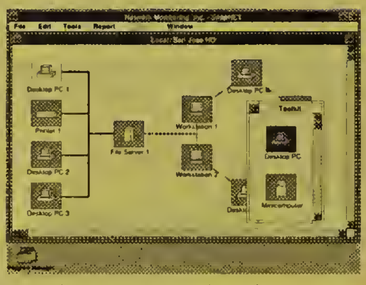

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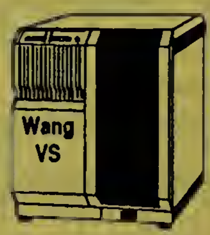

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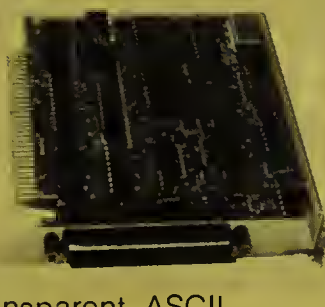

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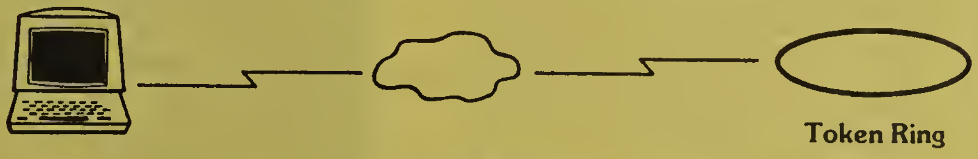

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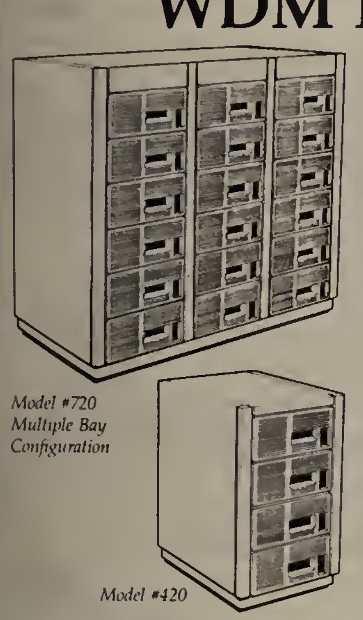

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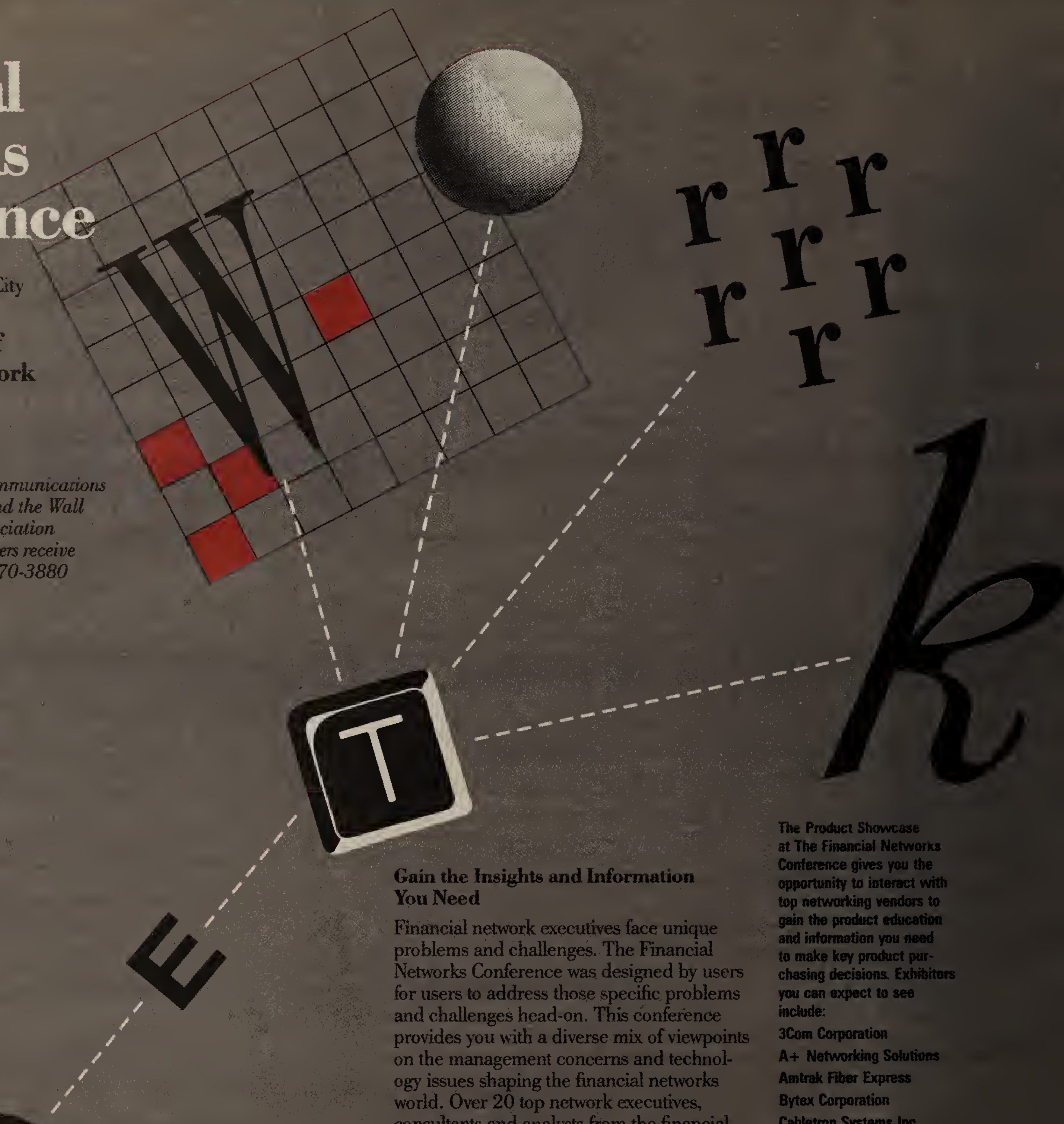

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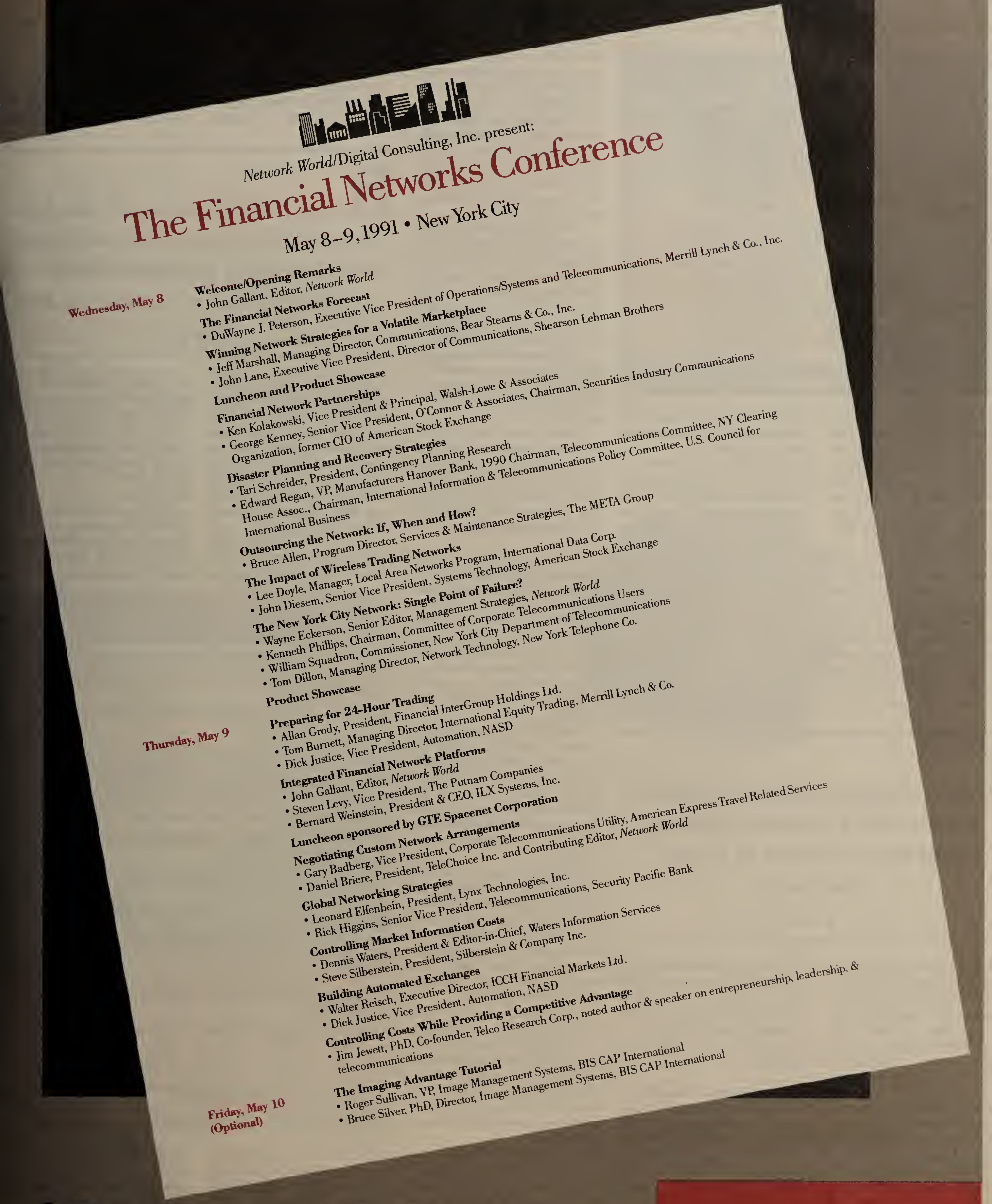

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- Jeff Marshall, Managing Director, Communications, Bear Stearns & Co., Inc.
- John Lane, Executive Vice President, Director of Communications, Shearson Lehman Brothers

Luncheon and Product Showcase

Financial Network Partnerships
- Ken Kolakowski, Vice President & Principal, Walsh-Lowe & Associates
- George Kenney, Senior Vice President, O'Connor & Associates, Chairman, Securities Industry Communications Organization, former CIO of American Stock Exchange

Disaster Planning and Recovery Strategies
- Tari Schreider, President, Contingency Planning Research
- Edward Regan, VP, Manufacturers Hanover Bank, 1990 Chairman, Telecommunications Committee, NY Clearing House Assoc., Chairman, International Information & Telecommunications Policy Committee, U.S. Council for International Business

Outsourcing the Network: If, When and How?
- Bruce Allen, Program Director, Services & Maintenance Strategies, The META Group

The Impact of Wireless Trading Networks
- Lee Doyle, Manager, Local Area Networks Program, International Data Corp.
- John Diesem, Senior Vice President, Systems Technology, American Stock Exchange

The New York City Network: Single Point of Failure?
- Wayne Eckerson, Senior Editor, Management Strategies, *Network World*
- Kenneth Phillips, Chairman, Committee of Corporate Telecommunications Users
- William Squadron, Commissioner, New York City Department of Telecommunications
- Tom Dillon, Managing Director, Network Technology, New York Telephone Co.

Product Showcase

Thursday, May 9

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- Allan Grody, President, Financial InterGroup Holdings Ltd.
- Tom Burnett, Managing Director, International Equity Trading, Merrill Lynch & Co.
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- Gary Badberg, Vice President, Corporate Telecommunications Utility, American Express Travel Related Services
- Daniel Briere, President, TeleChoice Inc. and Contributing Editor, *Network World*

Global Networking Strategies
- Leonard Elfenbein, President, Lynx Technologies, Inc.
- Rick Higgins, Senior Vice President, Telecommunications, Security Pacific Bank

Controlling Market Information Costs
- Dennis Waters, President & Editor-in-Chief, Waters Information Services
- Steve Silberstein, President, Silberstein & Company Inc.

Building Automated Exchanges
- Walter Reisch, Executive Director, ICCH Financial Markets Ltd.
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- Jim Jewett, PhD, Co-founder, Telco Research Corp., noted author & speaker on entrepreneurship, leadership, & telecommunications

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unlikely to be a single panacea for all of the company's networking requirements.

Many network managers continually question the whereabouts of ISDN's applications.

ISDN applications

Figure 1

	Primary Rate Interface	Basic Rate Interface
Value-added applications	☐ PBX computer links ☐ ANI processing ☐ Intelligent call routing ☐ Enhanced call management	☐ Voice/data desktop screen share ☐ Personal phone management ☐ Private network enhancement
Transport/ connectivity applications	☐ Dynamic channel assignment ☐ Switched video ☐ Switched LAN interconnect ☐ Bulk file transfer ☐ Private-line backup ☐ Single-line access to multiple services ☐ ANI delivery	☐ PC-to-PC file transfer ☐ Coaxial replacement ☐ Simultaneous voice and data ☐ Desktop video ☐ Centrex enhancement ☐ Group IV fax transmission ☐ High-speed remote access resource storing

ANI = Automatic number identification

GRAPHIC BY SUSAN SLATER SOURCE: NORTHEAST CONSULTING RESOURCES, INC., BOSTON

The ISDN services provided by the interexchange carriers, local exchange carriers and the majority of customer premises equipment vendors are transport and switching services. These are provided by the lower layer protocols in the Open Systems Interconnection model.

These lower layer services provide benefits by reducing the costs and improving the reliability of transmission and switching. But users do not typically think of these lower layer services as applications because applications use higher level protocols than transport and switching services.

Most users assume that reliable, cost-efficient transport and switching are available from one set of technologies or another. However, true applications are just beginning to make themselves known. Figure 2 on this page provides a summary of some of today's ISDN applications and benefits.

Value-added applications are those that depend on protocols and software at the higher levels of the OSI model. Transport and connectivity applications are the traditional ISDN uses that the local exchange carriers and interexchange carriers have demonstrated for several years.

PRI value-added applications have been heavily focused on linking PBXs and computers to provide better call management. Telemarketing applications have been very prominent among the ISDN applications. For example, Reynolds Metals Co.'s aluminum can recycling dealer-locater service uses ANI to locate the closest dealer to a caller.

Many of these applications allow a PBX to split the calling line identification information from the voice content of the call, use the ID to drive a data base lookup of specific customer information, forward that information to a computer and quickly route the call to an agent who has already been presented with the screen of associated information.

These ANI applications have been shown to pay back their investment in less than 18 months. They are generally implemented for a few hundred thousand dollars, which includes the cost of hardware, software and installation. In addition, these applications contribute directly to the company's bottom line by increasing sales while decreasing agent costs.

Call management applications based on ANI and ISDN's out-of-band signaling capabilities are likely to be a major growth area.

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Privacy issue affects ANI

Other value-added PRI applications include intelligent call routing capabilities based on ANI information. Following the impending resolution of several regulatory investigations regarding privacy issues, call management applications based on ANI and ISDN's out-of-band signaling capabilities are likely to be a major growth area.

While it is likely that some government jurisdictions will require the carriers to provide call blocking options — especially for residential users — ANI can still be useful for organizations dealing consistently with a limited number of outside callers. For example, one rail freight carrier uses ANI to support the quick call-up of shipping records.

In this case, the majority of business is done with 300 suppliers, which call a dozen or more times daily for status information. Thus, ANI is used to reduce call times and speed status reports.

Primary rate transport/connectivity applications, by comparison, are generally related to the dynamic channel assignment capabilities supported by ISDN. The PRI channel contains 23 B channels for user information, plus a D channel for signaling.

ISDN signaling can assign any single B channel or multiple B channels to various uses, depending on how the network is programmed.

These dynamic bandwidth assignment capabilities allow users to access multiple interexchange carrier or local exchange carrier services from a single access pipe and to change the service mix based on the time of day or day of week.

By being able to build up and tear down flexible bandwidth increments on demand, users have found that ISDN can provide a cost-effective alternative to dedicated leased or fractional T-1 lines. Many have found ISDN useful for LAN interconnection and private-line backup, as well as bulk image and graphics file transfers.

By being able to build up and tear down bandwidth increments, users have found ISDN can provide a cost-effective alternative to dedicated leased or fractional T-1 lines.

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While PRI value-added applications generally cost-justify themselves quite easily, BRI value-added applications have faced greater difficulty. Most of the problem lies with the lack of software, particularly software that can provide multivendor interoperability.

Many user organizations have explored the use of BRI to provide such capabilities as simultaneous screen sharing of voice and data, desktop management of telephone calls through ANI-driven on-line data bases and switched links into corporate electronic mail systems.

Unfortunately, most of the software available is geared toward small work groups and does not mesh well with embedded applications and the installed base of non-ISDN equipment. Key difficulties have been weak or nonexistent links to corporate E-mail systems.

For desktop-to-desktop connectivity, ISDN has generally been a distant runner-up to more traditional E-mail, data base management and LAN technologies, all of which are embedded in the corporation.

However, this situation is changing as such vendor firms as Ascend Communications, Inc., Teleos Communications, Inc. and others move to fill this niche, creating products that link ISDN with LANs and Systems Network Architecture.

ISDN in strategic plans

In summary, an objective evaluation of ISDN in North America shows mixed results. A few types of applications, such as PRI-based call management services, have flourished because they were clearly answers to pent-up user demand. Others, such as non-Centrex BRI local exchange carrier services, have yet to find much support in the marketplace, most likely because their availability has been limited.

The list of factors that might make a company interested in ISDN is longer than the list that might make one stay away. What this implies is that for many organizations, ISDN will have a valuable role in the overall telecommunications strategy.

During the 1990s, many companies are likely to use ISDN to support one or more applications. Some of these areas have already been explored by early users. Others will be realized as the carriers make ISDN available to a wider geographic base of users and as the customer premises equipment vendors settle on sets of features and functions that will interoperate transparently.

Some application areas that so far have gone untapped but are likely to be valuable include telecommuting, extension of computing resources from corporate headquarters to small business offices and expansion of electronic data interchange, electronic funds transfer and point-of-sale links to a wider range of customers.

In time, the nuts and bolts of ISDN will become less of a priority and the value-added applications that it can support will increase in importance.

ISDN is likely to become as much a part of the telecommunications manager's lexicon as T-1, Ethernet and data service units/channel service units. But for the end user, ISDN will be, as it should be, invisible.

Is ISDN for you?

Figure 2

Users likely to benefit from ISDN

- ♦ Have many end users with low-speed (under 64K bit/sec) desktop data requirements.
- ♦ Have special-purpose applications, such as telemarketing.
- ♦ Currently use Centrex.
- ♦ Have small offices where the entire work group can be converted.
- ♦ Have low levels of interoperable applications among different user groups (it won't matter if other users don't have ISDN).
- ♦ Have end users located in major urban areas.
- ♦ Have several buildings in a campus but no rights-of-way to connect them with private facilities.
- ♦ Use interexchange carrier intelligent network services (ISDN Primary Rate Interface may enhance efficiency and reliability of network access).
- ♦ Have employees who work at home and require data or video links to main offices.
- ♦ Can benefit from work group or desktop video.

Users who should investigate other options

- ♦ Have established commitments to LANs and LAN-interconnect technologies.
- ♦ Have a large embedded investment in private multiplexer-based backbone networks.
- ♦ Have many locations in nonmetropolitan areas.
- ♦ Are large users of scientific computing and high-speed bulk file transfer (above 1.544M bit/sec rates).

GRAPHIC BY SUSAN SLATER SOURCE: NORTHEAST CONSULTING RESOURCES, INC., BOSTON

Aspect offers remote control

continued from page 5

perform multiple functions simultaneously through windows. Users could, for example, open a configuration window for one ACD while actively monitoring the status screens of several other networked ACDs.

Users can access five screens:

- The **status screen** lists each application (customer service, order entry and telemarketing) on the CallCenter ACD, the work status of each agent and statistics including total number of calls waiting, the length of time the oldest call has been waiting and the number of abandoned calls.
- The **agent daily summary screen** gives the name, extension and logon time for each agent, as well as time spent idle, time spent answering voice messages and time spent on incoming and outgoing calls.
- The **agent line status screen** lists the name and extension of each agent and notes if the agent is on an inbound, outbound or an internal call.

It also lists whether the agent is on hold or available to take a call.

- The **trunk utilization screen** lists each trunk, the number of inbound and outbound calls each handled and the status of each trunk.
- The **voice system screen** contains the total number of voice messages left by callers, when they were left, how long they have been stored and how much disk storage space remains.

An Aspect Systems Management Center configured to handle three networked CallCenter ACDs will cost $70,000.

Aspect is also expected to announce Intelligent Interflow, a feature that will be standard on all new systems. It will enable users to program their ACDs to route calls to other systems when call volumes exceed preset thresholds set by the user.

The feature will enable overloaded ACDs to seize an analog or digital line to another system and use inband signaling to inquire if that switch can handle the calls. If the second switch is also busy, the first switch can ask still other ACDs if they can help. The calls remain in queue at the first switch during the interswitch queuing process.

Early user

An early user of the Call Management System is American Fund Service Co., which uses the system at its Brea, Calif., headquarters to manage its two-city T-1 ACD network, which has two nodes in Brea and a third in San Antonio, Calif. The system was installed two months ago.

"For us, Aspect System Management Centers consolidates three systems into one," said Jeff Jedinak, voice communications manager for American Fund. "It gives us a single point for managing our entire ACD network."

The two Brea CallCenter 200R ACDs support 325 agents, while the 200R in San Antonio serves an additional 125 agents. Before the mutual funds firm installed the system, Jedinak said, it managed the operations using three separate workstations, one for each CallCenter.

The company uses AT&T's Routing Control Service (RCS)-2, an 800 service feature that enables it to distribute calls among its centers.

"We had a rough idea of what percentage of total calls each site was receiving, but we weren't exactly sure if the call levels at each place were being exceeded," Jedinak said.

"With the Aspect management system, we can more accurately match the RCS percentages with each site's call thresholds, monitor trunking and make changes quickly," Jedinak said. ◘

Letters

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ways be a limit to spectrum availability. As I come from a land-mobile, microwave and broadcast radio background, I am quite sensitive to these limitations.

In my opinion, the FCC should not support any radio technology that can be economically served with copper, coaxial or fiber. Local-area networks fall into this category, as do broadcast television and radio in urban areas, for that matter.

Large and small businesses, public safety agencies, and state and local governments are all crying out for radio spectrum to support their mobile voice and data communications needs, not to mention mobile telephone users. Radio is their only choice.

In addition, in large urban areas, the private microwave users that would be displaced by Apple's proposal have nowhere to go. If any private microwave frequencies are still available, they will most likely be in a very high frequency band and will be highly unreliable due to high-frequency microwave's susceptibility to inclement weather.

The costs of leasing lines or a right of way to run a private cable to replace these wide-area microwave networks would be excessive compared with the cost of operating the microwave. In light of this, should wireless LANs be permitted to take up scarce spectrum merely so users can avoid the cost of running a cable within their building?

I cannot, in good conscience, say yes.

Mark Revis
Principal technical specialist
Transit Bus Operations, Inc.
Maplewood, N.J.

Vendors display DCE at CeBIT

continued from page 6

Christ, manager of communications systems at the University of Stuttgart, said while he supported the demo, it is not enough.

"The major obstacle to distributed computing is the absence of readily available applications," Christ said. The university, which found OSF's remote procedure call (RPC) technology too complex with too few applications available for use with it, designed its own RPC technology to enable computer systems on its network to kick off tasks on other computers, Christ said.

Distributed networking at the university has allowed scientists to access compute servers ranging from Silicon Graphics, Inc. engineering workstations and servers to Cray Research, Inc. supercomputers — and all from a single workstation on their desks. Prior to instituting distributed computing at the university, scientists were limited to host access via a terminal.

Of all the vendors involved in the DCE demonstration, Group Bull stood firmest behind distributed computing by also announcing its Bull Distributed Computing Model.

Although lacking in applications, the Bull Distributed Computing Model will provide users with a framework of applications and technologies supported by Group Bull and which can be used to develop distributed networks, said Lucio Pinto, Group Bull's executive vice-president for European research and development.

The model supports a number of de facto and de jure standards including the Simple Network Management Protocol (SNMP) and for electronic data interchange, EDI for Administration, Commerce and Transport (EDIFACT) and ANSI X12. Group Bull said it would introduce an SNMP-based network management system in May.

Carlo Barassi, director of computing at the financial institution Credito Italiano in Milan, Italy, said Group Bull's stated commitment to distributed computing is in line with his company's network strategy and should provide "a global protection of [network and computing] investments."

While OSI, the subject of last year's CeBIT demos, was not highlighted by many vendors at this year's show, some exhibitors announced new OSI support.

3Com Corp. announced its dual-protocol Transmission Control Protocol/Internet Protocol and OSI Connection Service software for its CS/2000 and CS/2100 terminal servers.

The software, which resides on the terminal servers, enables terminal users to establish connections to either a TCP/IP or OSI host. 3Com said the software would provide users with a migration path during periods when they must support both TCP/IP and OSI hosts.

The software will be available in the second quarter. ◘

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FCC poses rules to regulate provision of 900 services

Commission pushed to find solution to problem of unscrupulous activities of industry members.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — In the face of escalating consumer complaints and congressional concerns, the Federal Communications Commission last week proposed a set of rules to regulate the provision of 900 services.

In the past year, the FCC has received approximately 2,000 complaints about unscrupulous 900 service providers that have bilked consumers by using gimmicks, misleading advertising and even marketing campaigns targeted at children. At a public meeting last week, FCC officials described 900 services as "our largest area of consumer complaints."

Richard Firestone, FCC Common Carrier Bureau chief, said the level of complaints warranted regulation but the FCC is attempting to develop rules that will not overly burden 900 service providers.

"The interest of the commission is not to attempt to kill or frustrate the viability of the 900 industry," he said.

Although many firms use 900 numbers to provide legitimate business services such as stock quotes, assistance on software bugs and warranty information, some 900 providers have been taking advantage of consumers, Firestone said.

Complaints received by the agency include those from callers who were billed between $10 and $50 for one minute but were not fully informed of the costs up front, false advertising of products or services and deceptive methods of disclosing rates.

Until now, 900 service providers have been subject only to guidelines voluntarily imposed by the interexchange carriers providing their transmission services.

The proposed FCC rules would be the first formal industry regulation in this area.

New rules to the game

The agency is suggesting rules covering three broad areas. First, interexchange carriers providing transmission services for 900 providers would be required to ensure that each service has a preamble clearly disclosing the price of the service, a description of the service or product being offered and the opportunity for the caller to hang up without incurring any charges.

The second rule would give consumers a onetime opportunity to request that their local exchange carrier provide a 900 call-blocking feature free of charge. Customers might have to pay a nominal fee for removing or adding blocking after that.

The third proposal would prevent a local exchange company from disconnecting a customer's basic telephone service for failure to pay 900 charges. The 900 services typically use local carriers to provide billing services.

In addition, the FCC is examining whether the process currently used for problem resolution on 900 services is adequate.

The FCC proposal does not go as far as bills introduced in the House of Representatives and the Senate to regulate 900 services, Firestone said. Those bills include regulations on advertising of 900 numbers and mandatory bill adjustments for consumers who think they have been misled, he said.

FCC Chairman Alfred Sikes, a champion of reducing regulation where possible, indicated he had mixed feelings about imposing a new set of rules.

"While, clearly, there have been some really bad actors [in the 900 market], what we need to do is make sure that customers of 900 numbers make informed choices," Sikes said. "We should not pursue this as if all 900 service providers are illegitimate."

FCC Commissioner Ervin Duggan, however, said he wished the regulations had gone further.

"At some future date, we may have to take up the privacy concerns about [what companies do with the] information gained from 800 and 900 services," he said. He was referring to the practice of collecting callers' numbers through automatic number identification, packaging the information and then selling it to other firms.

Firestone said the FCC declined to look into the privacy issue because it was beyond the scope of the current proceeding.

AT&T at war over rivals' nets

continued from page 1

er long-distance carriers. Those rules, established through a series of conclusions from 1981 to 1985 known as the Competitive Carrier decisions, eliminated tariff filing requirements for carriers other than AT&T.

A reversal of the Competitive Carrier decisions would fundamentally alter the way long-distance carriers do business today. Nondominant carriers, such as MCI and US Sprint, could be forced to file tariffs for their custom network deals.

The carriers could also be mandated to provide cost support data and wait for FCC approval before providing services.

Those changes would add regulatory delays and open up now-private network arrangements to public scrutiny. This would give other users insight into the deals rivals are willing to cut and a chance to compare how those custom net arrangements stack up against AT&T's.

There has always been some question as to whether the FCC exceeded its authority in withdrawing the tariff filing requirement. The Communications Act of 1934 demands that "every common carrier . . . shall file schedules showing all charges." But the FCC said the act gives it the latitude to modify such requirements.

"The act requires tariffs; to the extent that the Competitive Carrier decision deviates from that, it was wrong," said John Langhauser, AT&T's general attorney for regulatory and antitrust matters.

Although they are not required to do so, most carriers continue to file tariffs. But AT&T says rivals should not be given the opportunity to file tariffs for standard services while providing custom networks through contract only.

Central to the Tariff 12 debate is this issue of how far AT&T can go in offering service packages that deviate in price, terms and conditions from standard tariff offerings. Rivals have pressed this point with the FCC and in court, and the legal fate of Tariff 12 is now on the line in an FCC reinvestigation.

> Those changes would open up now-private network arrangements to public scrutiny.
>
> ▲▲▲

Langhauser said AT&T wants the FCC to resolve questions about rivals' off-tariff deals. But if the agency continues to drag its feet on the complaints or rejects Tariff 12, the carrier may take the issue to court. AT&T may also file a complaint or court challenge questioning whether rivals are discriminating among customers by offering custom deals only to a select group of users.

Both MCI and US Sprint said they would file tariffs if necessary. "If we are required to file tariffs for custom deals, we will do that," an MCI spokesman said.

"We will provide service un-

California acts to spur LAN usage

continued from page 1

through competitive bids have taken months, even as long as a year, to complete, depending on their size and complexity.

Bill Hookono, chief of management and systems planning at California's Department of Forestry, explains, "This move legitimizes [LAN] technology for serious computing in the state. It's a big step."

California's Office of Information Technology (OIT) openly admits that for years it restricted the influx of LANs into state agencies because of concerns that users would undertake multimillion-dollar installation projects without resolving key planning and technology issues.

But budget pressures are forcing the state to adopt LAN technology in order to increase productivity and reduce computing expenditures.

State government is growing at 11% a year, but revenue is only increasing 7% annually. Ron Kuhnel, acting director of the OIT, said, "Information technology is the only thing that is going to close the gap."

In many cases, LANs have proven to be a more cost-effective solution than minicomputers or mainframe services provided by state data centers. LANs will also enable departments to share information, as well as expensive peripherals, more easily.

California has an annual budget of $56 billion, of which more than $1.3 billion is spent on information systems (IS) and networking, including personnel and services.

Less than a quarter — roughly 40,000 — of the state's employees have personal computers, and only about 25% of those devices are estimated to be connected to LANs. Another 60,000 employees use terminal-based systems.

Officials of some departments maintain that they will be able to get better prices by shopping around. But they view the sale of LANs through the state store as a significant endorsement of LAN technology and a moral victory for agencies that have been held back for many years.

Vendors and some IS executives in the state said the move does not address LAN support issues. But officials of the Teale Data Center, which handles data processing chores for many state agencies, say they are planning to offer agencies LAN consulting services.

> "This move legitimizes [LAN] technology for serious computing in the state."
>
> ▲▲▲

Kuhnel estimated that most agencies will be able to offset the cost of LAN purchases in a year or so through IS savings and productivity gains.

Last November, the state put a freeze on many types of expenditures, including computer equipment. Some exemptions were allowed as long as a clear benefit to the state could be demonstrated — as was the case with many LAN or personal computer purchases. Last summer, the OIT discontinued a policy that required agencies to include additional justifications for LANs in their annual plans.

Kuhnel points out that the state has no formal approval list for network purchases but has looked primarily to Banyan Systems, Inc.'s VINES for large networks and Novell, Inc.'s NetWare for the smaller ones. Microsoft Corp.'s LAN Manager, IBM's LAN Server and Apple Computer, Inc.'s AppleShare round out the rest of the current installed base. At this time, Businessland offers all but Banyan networks.

The OIT is working on a request for proposal for a new contract for the store that would begin in March 1992. It estimates that Businessland provided 70% of the personal computers sold to state offices in 1990. Last year, sales at the store were approximately $33 million.

American plots OSI migration

continued from page 1

tions that will allow airlines to share flight data with one another, said Parker, who is chairman of the Architectural Strategy Group (ASG), which is drafting the standard.

The ASG is a working group within the International Air Transport Association, the agency that defines various airline standards.

Parker said the group, which includes representatives from most major airlines as well as suppliers such as IBM, plans to submit the passenger airline data interchange portion of AOSIP to the United Nations EDIFACT board as soon as this May for adoption as an international standard.

That portion will support high-speed, interactive communications among airlines, helping them to move beyond simple store-and-forward network mechanisms.

For example, most forms of electronic data interchange to-

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C. Please Answer ALL Questions, Sign & Date the Form.

1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
13. ☐ Government State/Local
14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other ____________________

2 Job function: (check one only)

1. ☐ Networking Management (Responsible for both voice & data)
2. ☐ MIS Management (VP, Dir., Department Head)
3. ☐ Corporate Management (Chairman, President, Owner, General Manager, CEO, CIO, VP)
4. ☐ Data Communications Management (Responsible for data only)
5. ☐ Telecommunications Management (Responsible for voice only)
6. ☐ Financial Management
7. ☐ Engineering Management
8. ☐ Consultant (Independent)
9. ☐ Other ____________________

3 What is the scope of your involvement in purchase decisions for Network/Communications products + services? (check one only)

1. ☐ Enterprise Wide (Organization/Subsidiary/Division)
2. ☐ Multi Enterprise (Consultants)
3. ☐ Department Wide

4 What is the total number of sites for which you have purchase influence?

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

5 Your primary responsibility: (check one only)

1. ☐ Both Data + Voice
2. ☐ Data Networking Only
3. ☐ Voice Networking Only
4. ☐ None

6 Which transmission media do you use in your network: (check all that apply)

Public:
01. ☐ Switched-Based (DDD, Wats, Megacom, etc.)
02. ☐ Leased Line (not including T-1)
03. ☐ T-1
04. ☐ Fractional T-1
05. ☐ T-3/SONET
06. ☐ Broadband
07. ☐ ISDN

Private:
08. ☐ Satellite
09. ☐ Microwave
10. ☐ Fiber Optic

7 Is your network: (check all that apply)

LOCAL AREA NETWORK
1. ☐ Local (within building)
2. ☐ Local (in a campus environment)

WIDE AREA NETWORKS
3. ☐ International
4. ☐ National
5. ☐ Regional (several states)
6. ☐ Metropolitan

8 What is your network architecture? (check all that apply)

1. ☐ SNA
2. ☐ DECNET
3. ☐ OSI
4. ☐ GOSIP
5. ☐ MAP/TOP
6. ☐ TCP/IP
7. ☐ DCA (UNISYS)
8. ☐ OTHER ____________

9 What Is your LAN Operating System? (check all that apply)

01. ☐ 3COM (3+, 3+open)
02. ☐ LOCAL TALK (APPLETALK)
03. ☐ BANYAN (VINES)
04. ☐ DCA (IRMALAN)
05. ☐ IBM (LAN Server)
06. ☐ IBM (PC LAN PROGRAM)
07. ☐ MICROSOFT (LAN MANAGER)
08. ☐ UNGERMAN BASS (NET/1)
09. ☐ NOVELL (NETWARE)
10. ☐ TOPS
11. ☐ PROTEON (PRONET)
12. ☐ OTHER ____________________

10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCALTALK
8. ☐ 10BASET
9. ☐ OTHER ________

11 Which operating systems do you utilize? (check all that apply)

1. ☐ IBM DOS (VSE)
2. ☐ UNIX
3. ☐ OS/2
4. ☐ OS/2 Extended Edition
5. ☐ MVS
6. ☐ VM
7. ☐ VMS
8. ☐ XENIX
9. ☐ PICK
0. ☐ OTHER ______

12 Please indicate by vendor the number of mainframes/minicomputers installed in your network.

VENDOR	MAINFRAMES A	MINIS B
01. DEC		
02. IBM		
03. AMDAHL		
04. AT&T		
05. BULL HN IS		
06. NCR		
07. DATA GENERAL		
08. WANG		
09. HEWLETT PACKARD		
10. PRIME		
11. TANDEM		
12. UNISYS		
13. CONTROL DATA		
14. OTHER		

13 Please indicate by vendor the number of microcomputers/workstations:

A. Presently Installed in your network.
B. The approximate quantity you plan to install in the next 12 months.

MICROCOMPUTER/ WORKSTATION/ VENDOR	PRESENTLY INSTALLED A	PLAN TO INSTALL NEXT 12 MONTHS B
01. PCs based on 80286 chip		
02. PCs based on 80386 chip		
03. PCs based on 80486 chip		
04. 8086/8088		
05. Macintosh		
06. RISC-based workstations		
07. UNIX-based workstations		

14 What is your planned PC standard? (check all that apply)

1. ☐ EISA
2. ☐ MCA
3. ☐ NUBUS (MACINTOSH)

15 For which areas outside of the U.S. do you have purchasing influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

16 Check ALL that apply in columns A and B

A) I am presently involved in the purchase process for the following products/services:

B) I plan to purchase the following products/services in the next 12 months:

Presently Involved A	Plan to Purchase B	
A	B	LOCAL AREA NETWORKS:
01. ☐	☐	Local Area Networks
02. ☐	☐	LAN Servers
03. ☐	☐	LAN Services
04. ☐	☐	Cables, Connectors, Baluns
05. ☐	☐	Bridges, Routers, Gateways
06. ☐	☐	UPS
07. ☐	☐	LAN Storage Devices
A	B	COMPUTERS/PERIPHERALS:
08. ☐	☐	Micros
09. ☐	☐	Minis
10. ☐	☐	Mainframes
11. ☐	☐	Front End Processors
12. ☐	☐	Terminals
13. ☐	☐	Laptops
14. ☐	☐	Printers
15. ☐	☐	Work Stations
16. ☐	☐	Cluster Controllers

(continued on next column)

Presently Involved A	Plan to Purchase B	
A	B	SOFTWARE:
17. ☐	☐	Network Management
18. ☐	☐	Micro to Mainframe
19. ☐	☐	Network Security
20. ☐	☐	Call Accounting
21. ☐	☐	Distributed DBMS
22. ☐	☐	Communications Software
23. ☐	☐	Applications Software
24. ☐	☐	Network Operating Systems Software
25. ☐	☐	EDI Software
26. ☐	☐	E-Mail Software
A	B	DATA COMMUNICATIONS:
27. ☐	☐	Modems (over 9.6kbps)
28. ☐	☐	Modems (under 9.6kbps)
29. ☐	☐	T-1 Multiplexers
30. ☐	☐	T-3 Multiplexers
31. ☐	☐	Fractional T-1 Multiplexers
32. ☐	☐	Data Switches
33. ☐	☐	Matrix Switches
34. ☐	☐	Packet Switches
35. ☐	☐	Protocol Converters
36. ☐	☐	Network Management Systems
37. ☐	☐	Terminal Emulation Boards
38. ☐	☐	Facsimile Machines
39. ☐	☐	Diagnostic Test Equipment
40. ☐	☐	DSU/CSU
41. ☐	☐	Data Security
42. ☐	☐	Data Compression Equipment
43. ☐	☐	Network Adapter Boards
44. ☐	☐	Microwave
45. ☐	☐	Messaging Software
A	B	TELECOMMUNICATIONS:
46. ☐	☐	PBXs (over 1000 lines)
47. ☐	☐	PBXs (200 - 1000 lines)
48. ☐	☐	PBXs (under 200 lines)
49. ☐	☐	Key Systems
50. ☐	☐	Automatic Call Distributors
51. ☐	☐	Voice Messaging Systems
52. ☐	☐	Video Teleconferencing Systems
A	B	SERVICES:
53. ☐	☐	Switched Voice
54. ☐	☐	Dedicated Leased Line
55. ☐	☐	T-1
56. ☐	☐	T-3
57. ☐	☐	Digital Data
58. ☐	☐	Packet Switched
59. ☐	☐	Centrex
60. ☐	☐	Central Office Lan
61. ☐	☐	Satellite
62. ☐	☐	On-Line Information
63. ☐	☐	ISDN
64. ☐	☐	EMail
65. ☐	☐	VSAT

17 Estimated value of networking equipmen and services:

A: Which you helped specify, recommend or approve In the last 12 months?

B: Which you plan to help specify, recommend or approve In the next 12 months?

A	B	
1 ☐	☐	$100 million and over
2 ☐	☐	$50 - $99.9 mill
3 ☐	☐	$25 - $49.9 mill
4 ☐	☐	$20 - $24.9 mill.
5 ☐	☐	$10 - $19.9 mill.
6 ☐	☐	$5 - $9.9 mill.
7 ☐	☐	$1 - $4.9 mill.
8 ☐	☐	$500,000 - $999,999
9 ☐	☐	Under $500,000

18 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ over $10 billion
2. ☐ $1 to $9.9 bill.
3. ☐ $500 to $1 bill.
4. ☐ $100 to $499.9 mill.
5. ☐ $50 to $99.9 mill.
6. ☐ $10 to $49.9 mill.
7. ☐ $5 to 9.9 mill.
8. ☐ under $5 mill.

19 Estimated number of employees for your entire corporation:

1. ☐ over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ under 500

20 Which of the following ISDN products do you plan to purchase in the next 12 months? (check all that apply)

1. ☐ Basic Rate Interface Terminal Adapters
2. ☐ Primary Rate Interface Equipment
3. ☐ Voice/Data terminals
4. ☐ Voice-only terminals
5. ☐ Data-only terminals

21 From which of the following vendors will consider buying your PBX/Central Office Switch? (check all that apply)

A PBX	B COS	
A ☐	☐	AT&T
B ☐	☐	ALCATEL
C ☐	☐	ERICSSON
D ☐	☐	FUJITSU
E ☐		HARRIS
F ☐		HITACHI
G ☐		ROLM
H ☐		INTECOM
I ☐		MEMOREX TELEX
J ☐		MITEL
K ☐	☐	NEC
L ☐	☐	NORTHERN TELECOM
M ☐		SAMSUNG
N ☐	☐	SIEMENS
O ☐		STROMBERG-CARLSON
P ☐		TOSHIBA
Q ☐	☐	OTHER ____________

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der tariff with no special arrangements as long as AT&T is required to do the same," agreed Leon Kestenbaum, counsel for US Sprint.

However, he said US Sprint would oppose filing tariffs for custom deals, adding that the carrier does not view Tariff 12 arrangements as legitimate tariffs, which are supposed to lay out uniform rates, terms and conditions for all customers.

Filing tariffs for US Sprint's custom networks would be just as wrong. "We would not provide individual contracts that way," Kestenbaum said.

Some telecommunications attorneys say they believe AT&T's challenges pose a significant risk to custom network deals offered by US Sprint and MCI.

"If AT&T were to prosecute its complaint vigorously, it might lose at the FCC, but it has a fairly good chance of winning at the appellate level," said James Blaszak, a Washington, D.C. attorney who counsels large customers on deals with all three carriers.

Blaszak said he fears that users could be faced with uncertainties if the Competitive Carrier decision is overturned because it is unclear how carriers would respond to the requirement of filing tariffs once again.

AT&T's complaint "holds the potential to disrupt the market because it is not clear that every carrier will tariff every off-tariff deal," he said.

In a preview of how a court challenge to the Competitive Carrier decision might play out, judges in two related court cases have raised eyebrows at the asymmetrical system of regulation instituted by the FCC. In one of those cases, MCI protested a Competitive Carrier decision that banned nondominant carriers from filing tariffs even on a voluntary basis.

The judges ruled that the FCC had exceeded its authority and overturned the decision. They indicated that the authority vested in the FCC by the Communications Act to modify rules "suggests alterations, not — as the FCC now would have it — wholesale abandonment or elimination of a requirement."

More recently, in the appeal of the FCC's order that allowed AT&T to offer Tariff 12 deals, judges questioned the wisdom of the agency's approach.

"Under the present regulatory regime, only AT&T must file its rates as tariffs. Of course, the present regulatory situation presents advantages to AT&T's competitors . . . but the propriety of this asymmetrical regulatory system is not before us," the judges wrote.

AT&T says another case decided by the U.S. Supreme Court last June gives credence to AT&T's complaint. In that case, the court allowed a trustee for a bankrupt trucking company to collect the difference between the company's tariffed rates and an off-tariff deal the firm had negotiated with another customer.

Although trucking companies are governed by the Interstate Commerce Act, the Communications Act is modeled after that earlier law and cases in that area can be considered relevant precedent. Langhauser said the case indicates that off-tariff deals are not valid and that MCI and US Sprint should have to file tariffs for custom networks.

HP to announce API for Northern Telecom switches

By Bob Wallace
Senior Editor

PALO ALTO, Calif. — Hewlett-Packard Co. is expected to announce this week an application program interface (API) that will enable users and software vendors to develop programs that take advantage of links between Northern Telecom, Inc. central office switches and HP 3000 and 9000 series computers.

Programs based on the unnamed API will allow Centrex users to build applications that employ call information, including automatic number identification (ANI) and dialed number identification services (DNIS).

Programs incorporating the API will utilize call information provided by the central office switch and could help Centrex users boost agent productivity and speed order processing.

This announcement is an extension of HP's Applied Computerized Telephony (ACT) program, unveiled in January 1990. Under the ACT program, HP offered an API for programs integrating Northern Telecom private branch exchanges and HP computers.

To utilize programs based on the new API, Centrex customers will have to use Northern Telecom's Meridian Automatic Call Distributor (ACD) service, which is provided from a DMS-100 or DMS SuperNode central office switch equipped with Northern Telecom's CompuCall software.

Announced in November 1990, CompuCall enables Northern Telecom central office switches to pass call information to computers at user sites. CompuCall also works with IBM Application System/400 minicomputers ("Vendor troika teams in CO switch-to-computer trial," *NW*, Nov. 12, 1990). HP developed an interface to CompuCall.

> Programs based on the API will allow users to build applications that employ ANI and DNIS.

The customer must also have an Integrated Services Digital Network Basic Rate Interface (BRI) line between the central office switch and an on-premises device called an ACT Call Processing Server, a Unix workstation that acts as a gateway between the serving office and an HP computer.

The central office switch identifies an incoming number, which is communicated over the BRI line to the server. The server passes ANI information from the switch to the application on the HP computer, which sends a customer profile or other information over an Ethernet local-area network to the agent workstation as the call arrives from the central office switch.

Bill Kirby, director of CompuCall market development for Northern Telecom, said that in the future, Centrex users will be able to use any type of line to link the server to the central office.

Robert Alley, world ACT marketing manager for HP, said there are currently 12 Value-Added Business Partners in the ACT program and many of them will develop applications that build on the switch-to-computer linkage. ACT applications that currently integrate PBXs and computers will have to be modified to work with central office switches.

The Value-Added Business Partners include, Brock Control Systems, Inc., Coffman Systems, Inc., Coral Group, Inc., Digital Solutions, Inc. and Digital Systems, Inc.

It could take software vendors as little as three days to modify existing applications to accept caller ID from central office switches by building the API into applications, Alley said. Building in routing commands that tell the destination of the information could take much longer.

HP has created a three-day training course designed to help users and third-party business partners develop applications using the new API, Alley noted.

Neither company would identify beta users of the product.

HP's direct worldwide sales force and its third-party business partners will sell the server, server software and the API. The ACT Call Processing Server costs $30,000. The software that includes the API ranges in price from $495 to $21,980, depending on the type of system.

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day are batch-based and do not provide the rapid response time required when airlines, hotels or car rental companies need to access one another's hosts during the reservation booking process, Parker said.

"We're moving out of the old batching world into a more rifle shot, 'give me the answer to this problem right now' type of environment," Hopper said.

Making connections

Besides simply speeding transactions, adoption of AOSIP will make it far easier for transportation companies to establish links with one another, said James Juracek, vice-president of systems engineering for SABRE Computer Services.

"Make no mistake about it. We've done a lot of EDI work already. We've got it in production," Juracek said. "But the way we're dealing with it today is kind of by brute force. It's much more effective to drive standards."

American Airline's installation of an X.25 backbone is also a key part of its migration to OSI, though X.25 wasn't chosen solely because it is an OSI standard.

"We knew we needed any-to-any access from anywhere to anywhere in the world," Juracek said. "That dictated the need for an intelligent, computerized network predicated on switched virtual circuits."

He said X.25 was an unfortunate trade-off to get those switched virtual circuits, which enable any computer in the network to forge a link to any other on an ad hoc basis without permanent dedicated connections. It was unfortunate because X.25 has more overhead in terms of error checking than American Airlines would have liked.

But the network will serve as a vehicle to get American Airlines to the next phase of information processing — peer-to-peer communications.

In that environment, any computer on the network can initiate a transaction on any other to obtain data and fulfill a user's request.

"We prefer to look at computing environments as peripherals off the distribution system," Juracek said. "That peripheral could be a premises environment like a LAN, or it could be as large as SABRE."

The idea is to break away from the traditional SNA mode of computing in which the CPU is always the master to a slave terminal. SABRE, which is now based on the IBM TPF operating system, functions much the same way. But that is changing.

> "The machines all the way through the application layer will talk a standard protocol."

Sharing the labor

American Airlines has adopted a plan to break up many of the SABRE functions that today are handled primarily by eight IBM mainframes logically configured as 24 hosts, forming the heart of the SABRE system. Functions will be distributed to other functional processors, possibly even IBM hosts running operating systems other than TPF that are better suited to the tasks.

For example, TPF is geared toward transaction processing but is not an optimal data base manager. Applications such as pricing, which requires a relational data base, could run on a fault-tolerant machine optimized to support them.

Providing for quick and easy communications among applications on these functional processors is a key goal of the effort.

Today, IBM's LU 6.2 is used to link applications on different processors, though Juracek said LU 6.2 will likely be replaced by whatever is eventually adopted as the OSI program-to-program protocol.

Each application will have the intelligence required to initiate sessions with partner applications and obtain whatever data is required.

The applications will also have a common interface to the underlying communications protocol. That will give American Airlines more freedom to choose the best processor for the job, Juracek said.

"The machines and software all the way through the application layer will talk a standard interface protocol, which will enable us to put Unix in the environment, whether that be [Reduced Instruction Set Computer]-based or symmetrical multiprocessors, or highly parallel multiprocessors," he said. "We see all of those being peer players."

American Airlines has no illusions that this migration will happen overnight. Juracek said there is no specific time frame for the project, adding that it is a multiyear effort.

According to Hopper, there are some major stumbling blocks, including the lack of directories and working standards for managing a distributed OSI network.

"OSI offers a framework," he said. "It doesn't offer all of the specifics yet, particularly at the higher layers. But it is a framework that we can start playing into."

Open systems play role in victory

continued from page 2

munications system, allowing soldiers with laptop computers and access to a phone line to connect to the network.

As the only network tied to the DDN carrying unclassified data in the Kuwaiti theater of operations, the network was used by every Army unit in Saudi Arabia and by the U.S. Air Force, Navy and Marines.

Traffic between Saudi Arabia and the U.S. ranged from electronic mail to large batch processing jobs run on IBM mainframe data bases. The network carried all manner of unclassified traffic including supply, medical, payroll and personnel information, according to Weissert.

However, unlike traditional secure military networks used during the war for classified data, the logistics and support network for Desert Shield and Desert Storm was based on the Transmission Control Protocol/Internet Protocol.

The open nature of the network, though anathema to stringent military security requirements, proved invaluable in handling the rapid changes and high mobility typical of battlefield conditions, Weissert said.

The Army, like many civilian organizations, has a mix of computers from a variety of vendors, including IBM mainframes and AT&T Unix minicomputers. Creating a single net that could link the different systems and be managed from a central location required TCP/IP, according to Weissert.

The Army's affection for TCP/IP predates Operation Desert Shield. According to Weissert, the Army began installing TCP/IP four years ago at major processing sites that had previously used IBM's Systems Network Architecture.

The Army's procurement of routers from Cisco Systems, Inc. and other TCP/IP-related equipment was facilitated by several contracts with the Defense Department awarded in part to SMS Data Products Group, Inc., a prime contractor that had been advocating the use of TCP/IP for more than just the DDN to the Defense Department since 1987, according to David Schoenbrott, SMS national account manager.

The Army's use of open systems is mandated under the Government Open Systems Interconnection Profile (GOSIP), which calls for the migration to OSI standards. But with the scarcity of OSI products in the U.S., the Army has moved to TCP/IP.

Weissert kept OSI in mind as he extended the Army's network to Saudi Arabia.

"I was trying to use GOSIP as much as possible," he said. OSI would have provided "a much more robust, dynamic network, but we couldn't get [OSI products] fielded in time."

Beyond networking a heterogeneous environment, the Army required a highly flexible system. The moves, adds and changes to the Army's network during Operation Desert Storm would have given the average corporate network manager nightmares.

With the TCP/IP-based network, soldiers in Saudi Arabia were able to simply plug their truck-borne computers into the network and let Weissert access and configure the systems from Information Systems Command headquarters at Fort Huachuca, Ariz.

The dynamic routing capabilities of TCP/IP enabled Weissert to keep track of the systems. To ensure access to the roving computers, Weissert assigned each system a network designation rather than a node designation. This allowed him to use the Exterior Gateway Protocol (EGP), which determines the routes between networks.

The Cisco routers, used by the Army to build its network in Saudi Arabia and around the world, regularly updated the Internet routing tables using EGP.

"Within three minutes, all the mail bridges and core gateways knew where [the Army's computers] were," Weissert said. Mail bridges and core gateways are the systems used in the Internet to maintain and distribute address and routing information.

Weissert said the unusually frequent moves required him to masquerade his computers as networks, but if users tried to do the same, the number of networks would artificially increase beyond the capability of the EGP protocol to update routing tables.

Weissert managed the network from Fort Huachuca using a Unix-based expert system called Global Internet Information System developed by the Cambridge Institute of Technology, Inc. and refined by the Army. The system can monitor and control the Army's 1,500 computers and 56 networks around the world.

With the system, Weissert was able to monitor the performance of the network in Saudi Arabia and reallocate bandwidth as needed, he said.

After determining that bandwidth was available on the network, the Army allowed ordinary soldiers to use E-mail to send messages to their families in the U.S. and Germany. The program was dubbed "E-mail to the Foxhole."

Soldiers were able to write messages on laptop computers and hand floppy disks to computer operators at their battalion headquarters. The operators forwarded the messages over the network to the Internet host computers nearest to the soldiers' families. The local Internet managers then forwarded the messages to the families.

Despite the flexibility and convenience, using the Internet was not risk free. At the height of the air attack in January, the Internet went down, cutting off the Army's computers, according to Weissert.

"Saudi Arabia and the whole network was off the air for about 15 minutes," he said.

The seven mail bridge computers that maintain the routing information for the Internet were overloaded and the routing information became corrupted. The Defense Communications Agency, which oversees the mail bridges and core gateways, quickly installed a software patch, already planned, that boosted the capacity of the machines from 1,800 to 2,700 routes each.

In the meantime, Weissert put together a static routing table and updated each of the Army's computers as a temporary measure.

The only other problems affecting the network were the accelerated wear-and-tear of equipment from sand and heat, and tanks running over cables — "things you expect in war," Weissert said.

Siemens to add CMIP to plan

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things together to provide protocol independence under one API, and the final product will run on any platform," Thiemann said.

The DME proposal was originally submitted late last year in response to an RFT by the OSF. Other companies including Digital Equipment Corp. and Microsoft Corp. have submitted DME proposals, although the OSF declined to say which companies are combining their efforts.

Analysts said the HP-IBM team was already carrying a lot of clout and they do not see the addition of Siemens to be a factor in furthering the group's chances for acceptance.

The original RFT called for "proposals and technologies to define and implement a [DME], which will provide an extensible framework to unify system, network and application management," OSF said. The major goals are "to simplify the steps needed to manage stand-alone and distributed systems, and to provide a solid foundation for the future development of management applications."

OSF will begin testing the proposals in May and expects to announce a decision in the fall.

Alliance develops plan

continued from page 2

Howells, manager of standards at Boeing Computer Services Co., addressed open systems strategic planning and business case methodology. The group emerged with a proposed process to help firms define their computing needs and prepare a cost analysis of open systems and options.

Another group, led by Sally Atkins, a consultant in strategic planning at John Hancock Financial Services, Inc., resolved to build a data base of information on open systems accessible by electronic mail.

The group whose goal was to publish a list of action items that users could pursue to bolster the use of open systems — such as lobbying company management and legislators — was only sparsely attended.

Members "voted with their feet," said Bud Huber, head of the User Alliance and manager of advanced networks integration at Hughes Aircraft Co. The issue of defining specific actions became secondary to other goals such as building an OSI information data base and creating sample business cases for open systems.

One of the hot debates during the three-day meeting concerned the group's vision statement. Although it still faces a final vote, the upshot of the statement was that alliance members will work to leverage the influence of their companies to create an environment "in which information technology produces both hardware and software interoperable and interchangeable within and across enterprises."

A debate over whether the group should press vendors for "interchangeable" products — products that can be swapped out and replaced with others with minimal tuning — became lively.

While some said interchangeable products were either unrealistic or would stifle vendor innovation, others said the time was approaching when technologies such as object-oriented software development would allow for interchangeability.

A user from a large petroleum company who requested anonymity said, "We need to be able to take an end-user data base and interchange it with another [vendor's] data base because we can't be sure the vendor will be around forever. It's the responsibility of the user to make sure his company is not held hostage to one product."

The alliance allowed vendors to attend a portion of the meeting as observers. Mike Kaminski, the Manufacturing Automation Protocol program manager at General Motors Technical Center, took the opportunity to deliver a salvo across their bow regarding vendor pricing practices for OSI products.

Kaminski accused vendors of keeping the prices for OSI products high while practically giving away proprietary and TCP/IP products.

"If you go to Digital and buy a computer, DECnet comes with it. But if you want MAP on it, it costs $2,500 extra. Why?" Kaminski questioned angrily. He noted several other vendors had similar pricing practices.

Bill Selmeier, director of the North American operations of Dowty Network Systems, Inc., conceded that the industry's pricing was lopsided in favor of TCP/IP. "One of the problems right now is you don't have enough competition in [the OSI] environment. That's why OSI is at a premium," he responded.

Throughout the week, the group debated how to win the minds of systems purchasers, primarily MIS directors and network managers, to the cause of open systems. Kaminski said the educational efforts have much further to go.

At General Motors Corp., where the company's C4 program is resulting in large installations of robots and automated systems for car production, network purchases are being carried out by product engineers who purchase the robots and, with them, the networks to which they pay little attention.

"We're trying to get our act together. But there's a lot of that [independent buying] going on," Kaminski said.

NETWORK WORLD

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Banking on nets for payments

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account number. The other is to imprint a special code along the MICR line when the check is printed.

In either case, the first check reader/sorter that sees the check, typically at the bank that cashed it, will truncate it.

A limited number of banks have been practicing check truncation under special agreements using a file format called TRC to exchange MICR line data electronically. But TRC can only be used with certain types of checks such as stock dividend checks and corporate payments of less than $2,500.

TRC generates one packet of data for each check, which makes it costly to process TRC files because processing fees are charged on a per-packet basis.

The Arizona Automated Clearing House Association last week said it will utilize the TRC standard to offer a check truncation service to banks in Arizona. It is aimed at making check truncation more widespread.

The Federal Reserve Bank of Minnesota has been involved with check truncation using the TRC format for four years. However, its program is limited to banks within its region and requires the bank cashing the check to transport it to the Federal Reserve Bank of Minnesota, where it is truncated.

"We expect to truncate in excess of 70 million checks in 1991," said Ted Umhoefer, vice-president in charge of check operations at the Federal Reserve Bank of Minnesota.

Minnesota pilot

The Federal Reserve Bank of Minnesota is now embarking on a project to truncate checks at the bank that cashed them as opposed to when they are received from those banks (see "Banks to test electronic rebate check clearing," page 5).

The pilot will test an emerging standard called TRX. Developed by the Federal Reserve Bank of Minnesota, NACHA, the National Association for Check Safekeeping (NACS), Mellon Bank Corp., First Wachovia Corp. and Citibank N.A.'s Delaware subsidiary, TRX can be used with a wider variety of checks and enables data from as many as three checks to be stored in one data packet, thus holding down the per-packet processing charges.

By squeezing information from multiple checks into one packet, the Federal Reserve Bank of Minnesota hopes to reduce per-check processing costs from 4 to 5 cents each to 1.7 cents each.

NACS developed the TRC standard that is currently used by a group of 10 banks, including BankAmerica Corp., Valley National Bancorp and The Chase Manhattan Corp. NACS last year formed a tight alliance with NACHA, which provides administrative support for the group.

The absence of the TRX standard is holding some banks back from implementing check truncation.

"Until NACS comes up with more formal standards, we've got other higher priority projects to work on," said Michael Paulette, cash management executive officer at C&S/Sovran Corp.

But others have developed their own standard that enables them to exchange electronic files requesting payments and simply send the paper checks later. The Electronic Check Clearing House Organization (ECCHO) is a group of 13 banks including Chemical Bank, Security Pacific National Bank, Bankers Trust Co. and Wells Fargo.

Banks in ECCHO want the speed of delivering payment requests electronically but also want to continue receiving their own checks to archive them or send them to customers.

They are opposed to archiving checks at the bank that cashed them for fear they may get lost if a bank goes out of business or merges with another bank.

Losing the check could make it difficult to resolve customer services problems, said Wells Fargo's Kvederis.

Tool aids in client/server

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Ellipse/PS is a production system that supports applications developed using Ellipse/DE. Ellipse/PS partitions application processing between clients and the server to optimize performance.

In addition, it coordinates transaction processing and ensures data integrity.

Meets the need

Analysts said Ellipse could meet a real need among users for tools to build next-generation business applications. Currently, companies must devote large pools of programming talent and commit to long lead times in order to develop client/server or distributed processing applications.

John Rymer, senior consultant with the Patricia Seybold Office Computing Group, said, "This product is designed for those major applications on which companies base their business. Ellipse is a high-level development tool that will save companies time and take care of a lot of the complicated details under the covers. I haven't seen anything yet that does everything that it does."

Ellipse is scheduled for availability in July directly from Cooperative Solutions, based here. With beta-testing just under way, no users were available for comment.

The Ellipse system and applications developed with it run on Intel Corp. 80386-based personal computers with OS/2 Presentation Manager, and 386 or 486 servers running OS/2 with LAN Manager or LAN Server. Support for Microsoft Corp.'s Windows 3.0 is scheduled for October. The applications can work with Microsoft's SQL Server, with support for OS/2 Extended Edition's Database Manager slated for October. A Unix version of Ellipse is scheduled for availability in early 1992.

> "I haven't seen anything yet that does everything that [Ellipse] does."

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Ellipse is designed to eventually allow applications to run in a number of target environments, independent of the hardware platform, operating system, communications software, SQL data base management system and user interface.

In development for the past two years, the company initially chose to support OS/2 and did not anticipate the sudden popularity of Windows. In addition, IBM's recent decision to sell NetWare might slow acceptance of OS/2-based networks and demand for development systems such as Ellipse.

Cooperative Solutions did not include plans to support Novell's NetWare in its initial announcement. President and Chief Executive Officer Dennis McEvoy said the product is targeted at the next generation of LANs handling more than file and print sharing, which NetWare primarily supports. Ellipse, he said, is designed to help users support complex application and data base requirements.

Ellipse/PS is licensed on a per-server basis. A license for servers supporting as many as 10 users is $3,495; server licenses for unlimited users cost $9,995. A multiprocessor option is also available.

Ellipse/DE for five-developer project teams is priced at $65,000. An implementation consulting program, priced at $30,000, accompanies the initial purchase of Ellipse/DE and supports project planning, design and developer training.

Calendar

April 1-5, San Diego — ISSA '91. Contact: The Information Systems Security Association, P.O. Box 9457, Newport Beach, Calif. 92658; (714) 854-5500.

April 7-10, Chicago — The Fourth Annual Corporate EFT/Financial EDI Conference. Contact: Ruth Blalock, program manager, Executive Education, UNC Business School at Chapel Hill, Campus Box 3445, Kenan Center, University of North Carolina, Chapel Hill, N.C. 27599; (919) 962-9630.

April 9-11, Reston, Va. — ANSI's 1991 Annual Public Conference, Seminar & Workshop. Contact: ANSI, 1430 Broadway, New York, N.Y. 10018; (212) 354-3300.

April 10-12, Anaheim, Calif. — Voice '91. Contact: Rhetorex, Suite 208, 1671 Dell Ave., Campbell, Calif. 95008; (408) 370-0881.

April 16-17, Boston — The Downsizing Conference: Moving From Mainframes to PCs. Contact: Digital Consulting, Inc., 204 Andover St., Andover, Mass. 01810; (508) 470-3880.

April 16-17, New York — LAP&PALMTOP '91. Contact: Peter O'Connor, Laptop Expositions, 104 E. 40th St., #808, New York, N.Y. 10016; (212) 682-7968.

April 22-25, Boston — 1991 Internetworking Tutorials. Contact: Interop, Inc., Suite 100, 480 San Antonio Road, Mountain View, Calif. 94040; (415) 941-3399.

April 25-26, Miami — InterCom '91. Contact: Latcom, Inc., Suite 260, 300 Aragon Ave., Coral Gables, Fla. 33134; (305) 446-5150.

April 29-May 2, Weisbaden, Germany — 17th Annual High-Technology Services Management World Conference. Contact: Jean Doynow, Jean Doynow Associates, 19 West 44th St., New York, N.Y. 10036; (212) 840-6570.

May 8-9, New York — The Financial Networks Conference. Contact: Digital Consulting, Inc., 204 Andover St., Andover, Mass. 01810; (508) 470-3880.

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